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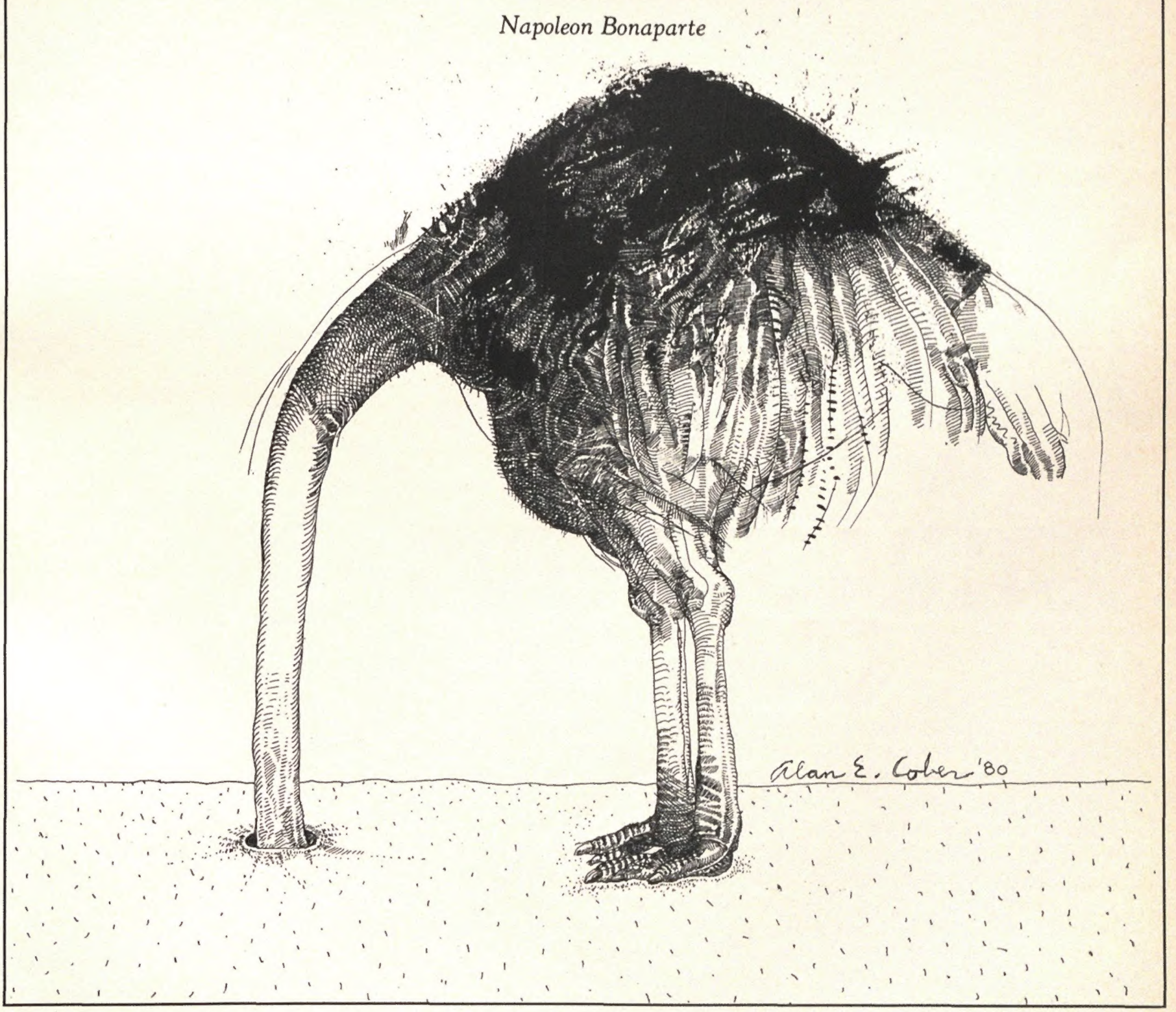

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July 1982

Smithsonian

Volume 13, Number 4

Table of Contents

Cover: First Class Cadet Helen "Holly" Holtzman hauls in a line on Coast Guard training ship *Eagle* (p. 32)
Photograph by Marcus Halevi

8 *The view from the castle* by Secretary Ripley
12 *Letters to the Editor*
16 *Phenomena, comment and notes* by Albert Rosenfeld
24 *Around the Mall and beyond* by Edwards Park
28 *Picture credits*

32 **The Coast Guard: poor, but proud and ready**
"Multimission" is the service's byword, but it may have to shift some of its functions elsewhere
By William A. MacLeish
Photographs by Marcus Halevi

48 **The most Spanish of Spanish artists was 'The Greek'**
A great exhibition of El Greco's work, now touring this country, affords a fresh view of his genius
By John Canaday

62 **Secrets of a freshwater pond**
Beneath a placid surface, the water seethes with tiny creatures that compete fiercely for survival
Photographs by Robert Noonan

72 **New light on the City of David**
Under the spades of enthusiastic diggers, many of them volunteers, ancient Jerusalem is emerging
By Dora Jane Hamblin
Photographs by David Rubinger

86 **After *Star Wars*, after Pac-Man, comes *TRON***
Disney Studios uses the electronic graphics of video games to animate a dazzling new film
By Michael Schrage
Photographs by Peter Angelo Simon

98 **Golden Gate Bridge—'impossible,' but *there***
It took 68 years of argument, four years of work and $27 million to achieve its soaring reality
By Jack Fincher

109 **A Highland fling in North Carolina**
Every July, Scots and pseudo-Scots gather by the thousands to reenact old Caledonian rituals
By Richard L. Williams
Photographs by Kay Chernush

118 **Birds' songs are more than music**
Research is under way on why birds sing, how they learn to, and why the melodies are so elaborate
By Joel Gurin, illustrations by John Huehnergarth

128 *Book reviews*
134 *Additional reading*
136 *July events at the Smithsonian*
138 *Smithsonian tours*
140 *Poor Weinberger—his name's too long*
By Richard Conniff

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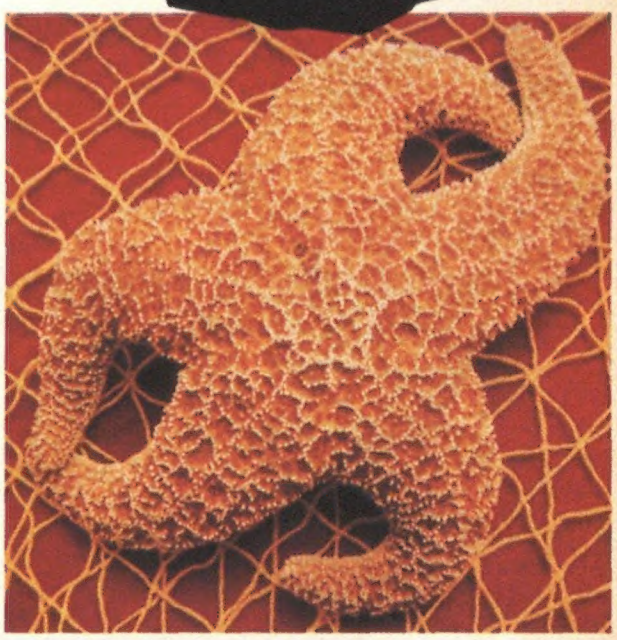

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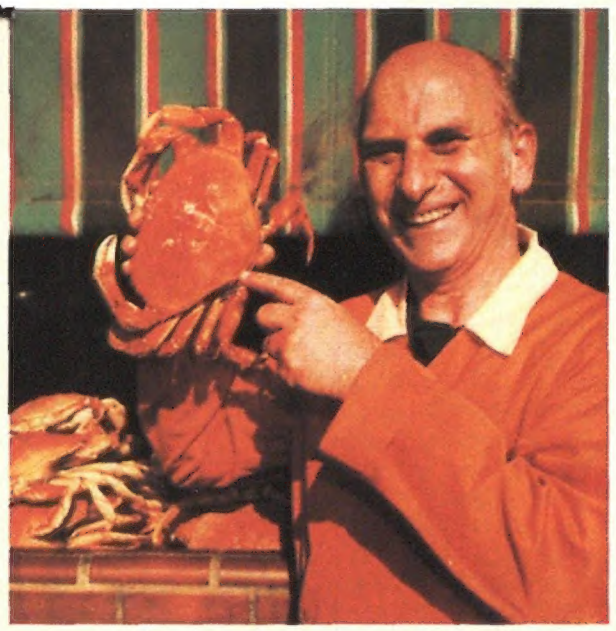

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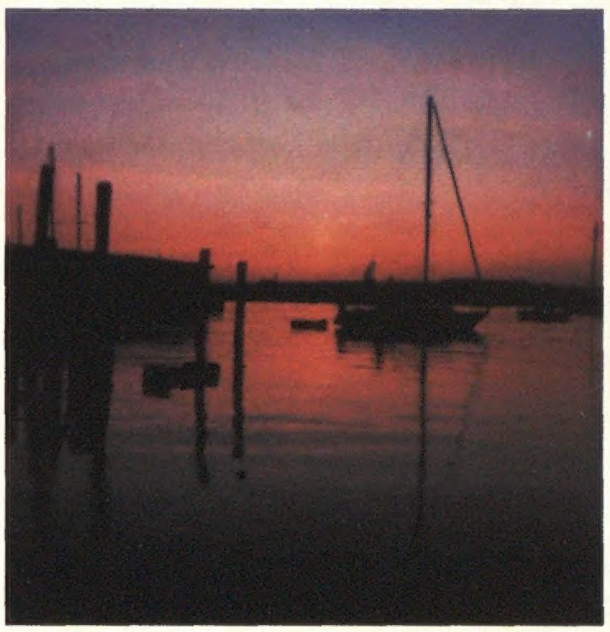

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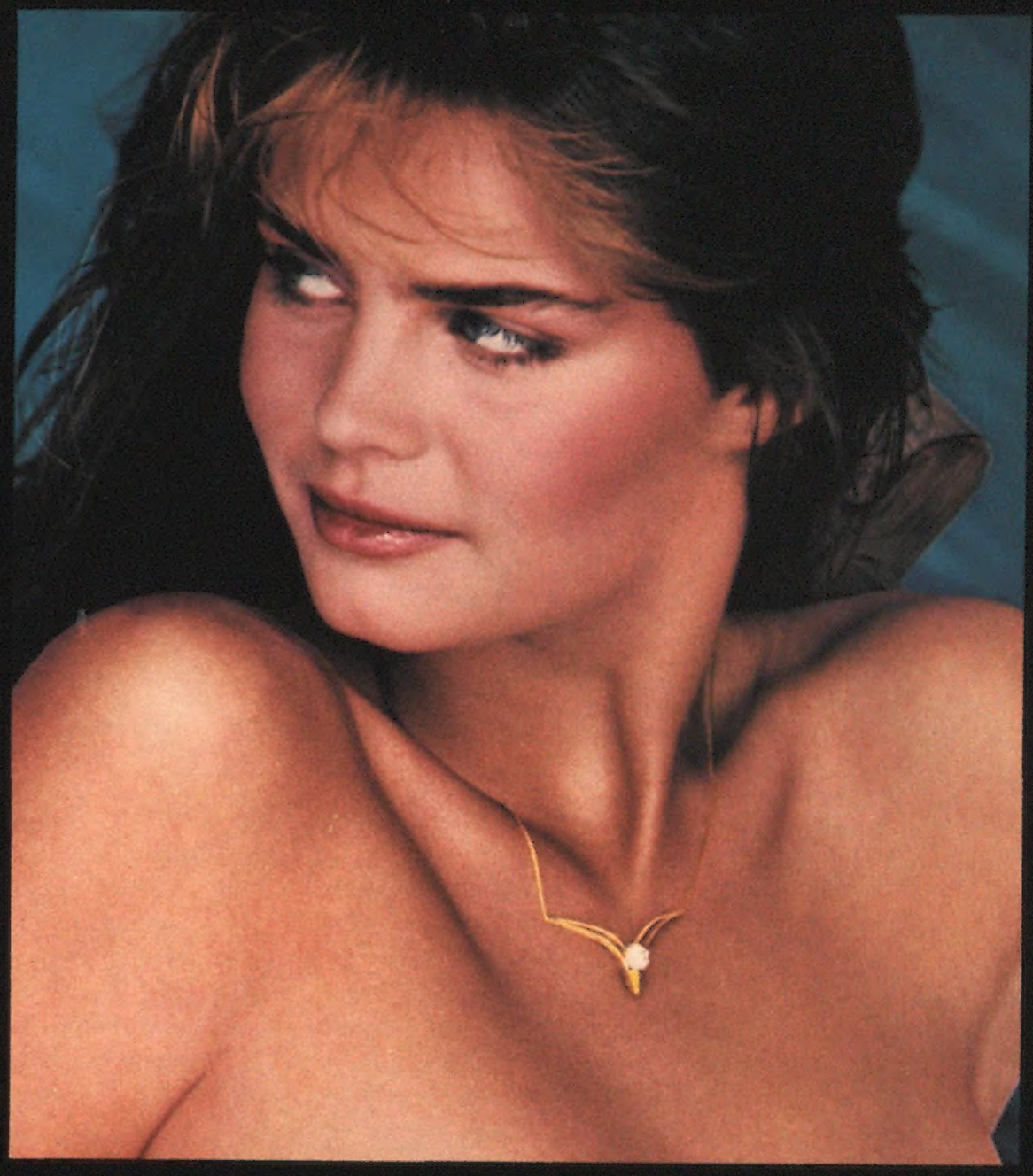

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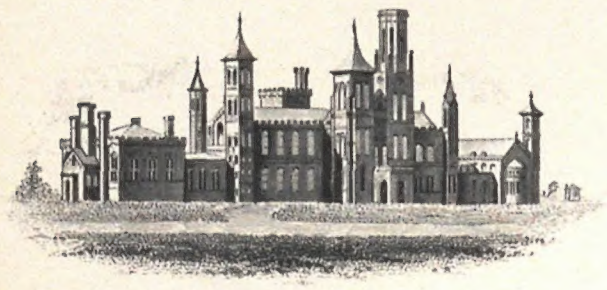

Joseph Alsop fulfills a longtime plan by boldly writing a big book on the fascinating history of art collecting

At lunch four years ago, Joseph Alsop, the former commentator, columnist and—among other things—expert on FDR (SMITHSONIAN, January 1982), told me he was going to give a series of lectures at the National Gallery of Art here in Washington, in the Andrew W. Mellon series in the fine arts.

I was somewhat surprised by his boldness, and said so. He replied that it was high time that his interest in connoisseurship and his lifelong study of Greek and later-Hellenistic culture should be exposed in this manner. Later I attended some of the lectures, finding his erudition fascinating and his style, as always, compellingly interesting.

This aspect of Mr. Alsop's work has now culminated in a vast but readable tome, *The Rare Art Traditions*, on the history of art collecting and all its linked phenomena. I have enjoyed the book tremendously; it combines a rich anecdotal style with a synthesis of what art collecting is all about.

As Mr. Alsop defines it, art collecting is a basic by-product of the creation of art. Art history, another by-product, proceeds "hand in hand with art collecting." And art collecting "automatically begets an art market to supply the collectors."

It is a way of looking at art that is perhaps not the perspective of art historians themselves. Few persons except for a so-called amateur would have undertaken to describe the process of art collecting as a historical procedure.

Art museums, Alsop believes, were an inevitable by-product of art production, deriving from the cabinets of great rulers, notably in the 17th-century Italian world of the Medicis. Next in his sequence, the author describes art faking, which he states has existed certainly since Sung times in China. Then he goes on to examine the process of revaluation, as he calls it, the ebb and flow of fashion in which art in its various eras and epochs is denigrated or recharged with stylishness over cycles of time. Finally he discusses the evolution of antiques as a collecting phenomenon—a fashion not new.

In our time the fashion has reached an apogee with the enormous payments of "super-prices," as Alsop calls them, for works of art. But the craze for collecting has extended back for centuries to the cabinets of great connoisseurs and wealthy rulers, as a hunger to possess the old and the unique, which started perhaps in Roman times and has never ceased.

This whole book, then, is a historical summary of the fashions, styles and collection of art, interspersed with some extraordinary anecdotes the author has derived from history, from diarists' manuscripts and from accounts of the transfer of antiquities and art objects from one country to another. The story of all this Alsop relates to behavioral patterns in humans, a subject that has fascinated me in my own study of the development of collecting and museum acquisitions.

For I have found tribal groups in far-off New Guinea as concerned with acquiring rare objects as is any present customer of the great auction houses of America and Western Europe. Alsop, too, finds that collecting is a "curious cultural-behavioral pattern" running through time as a recurrent theme. I can add to that only that it seems to run into the most primitive lairs of tribal custom.

An aspect of all this that seems tragically paradoxical is the fact, as Alsop points out, that some of the greatest art has been destroyed by acts of thoughtless vandalism and greed. Why else should the Aztec treasures have been melted down for their gold and silver after the Spanish explorers received tribute from the emperor in Mexico? Dürer, quoted by Alsop, found these objects unimaginably beautiful, but it was not long until they were destroyed. Similarly, the robbing of tombs is an example of the plundering of art for venal purposes.

I much enjoyed "Envoi," the chapter in which Alsop tells of the dying comments of Cardinal Mazarin, one of the greatest collectors of all time. As the Cardinal tottered through his galleries looking from one beautiful object to another, from tapestries to paintings, he reportedly said, "I must leave all this! Good-bye, dear pictures which I have so much loved, which have cost me so dear!" Thus it is with the history of collecting. All collectors know the experience of enjoying objects, of *possessing* them—and eventually of considering parting with them.

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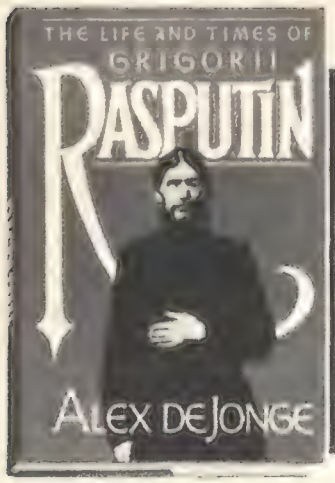

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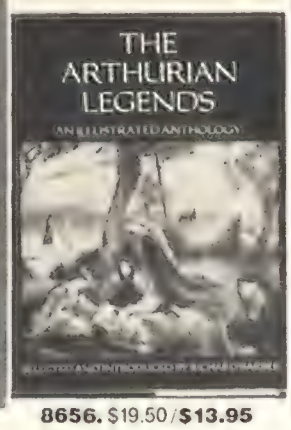

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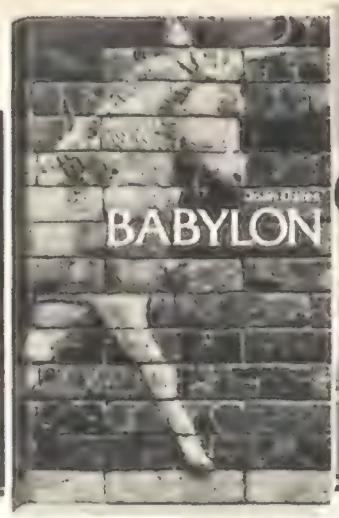

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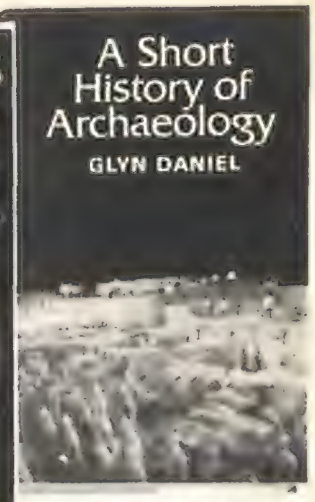

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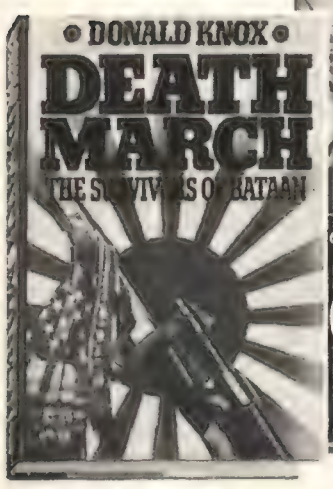

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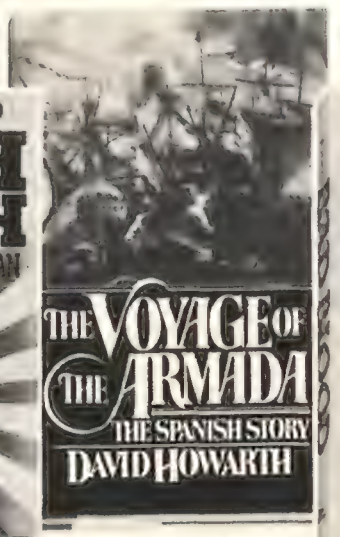

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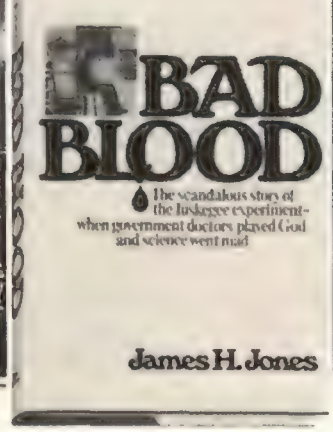
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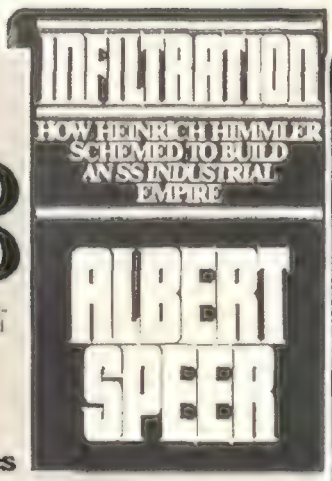

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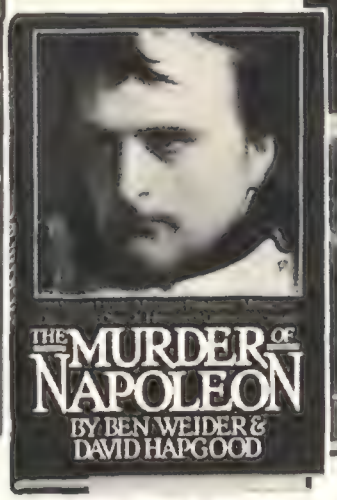

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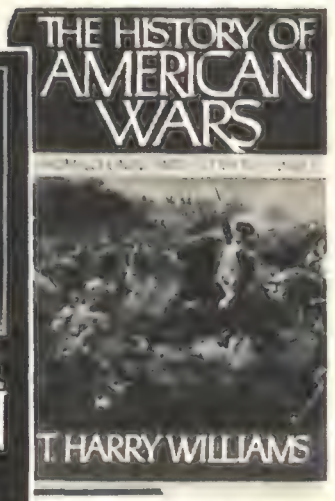

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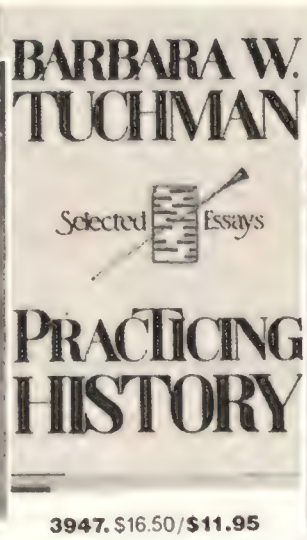

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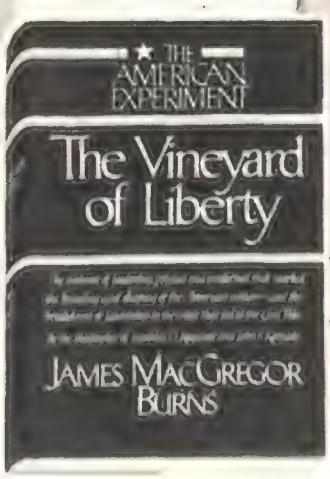

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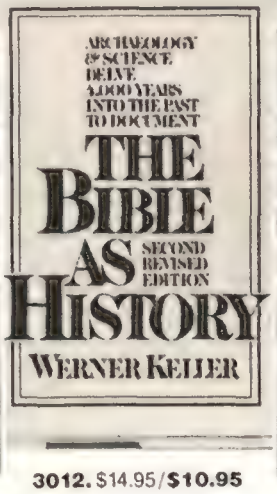
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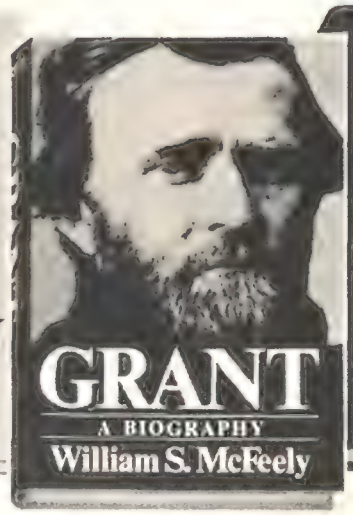

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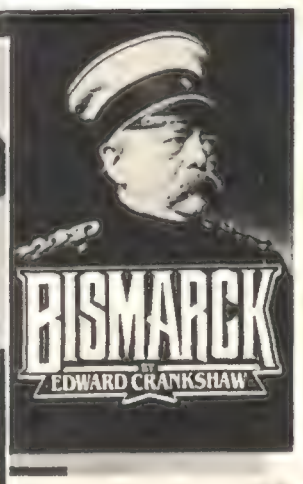

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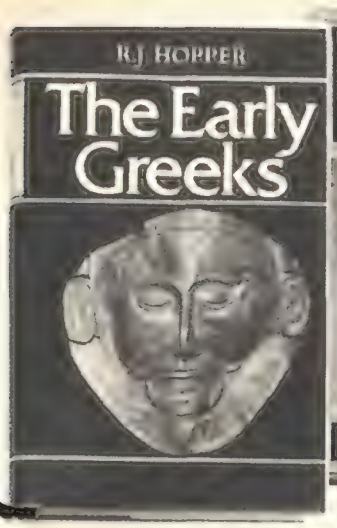

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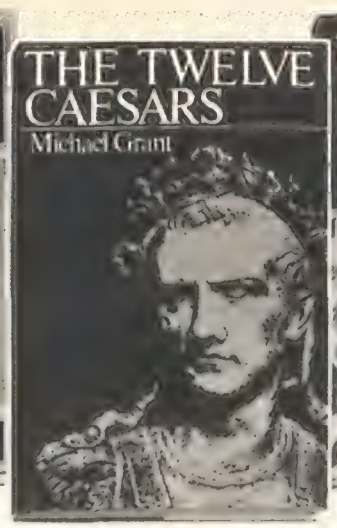

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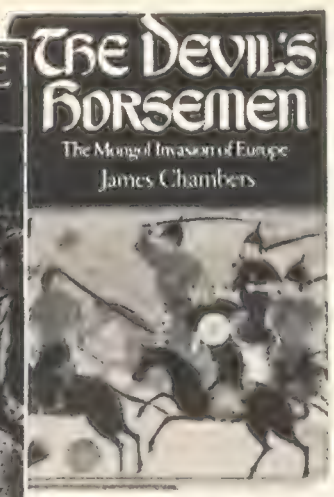

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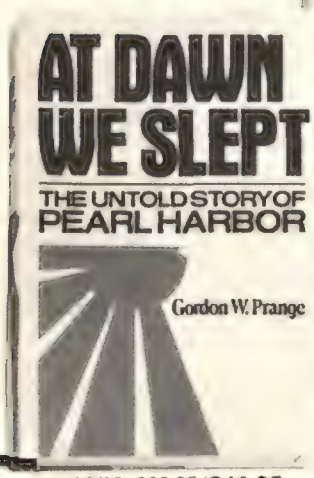

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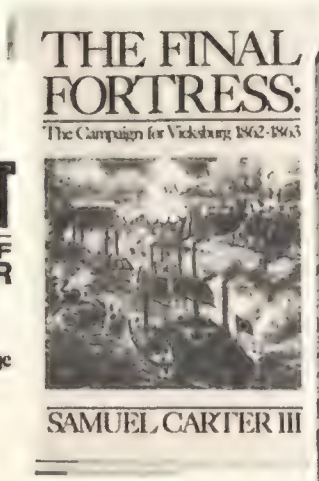

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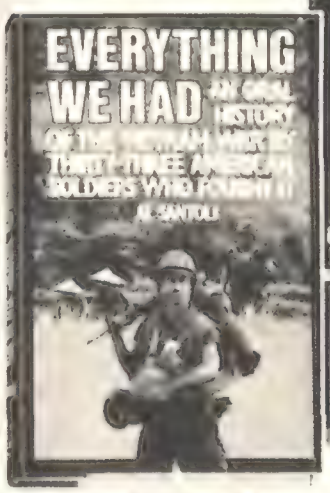

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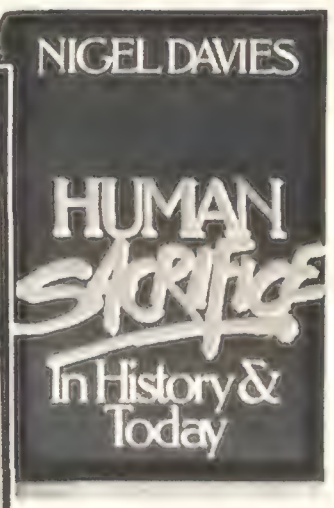

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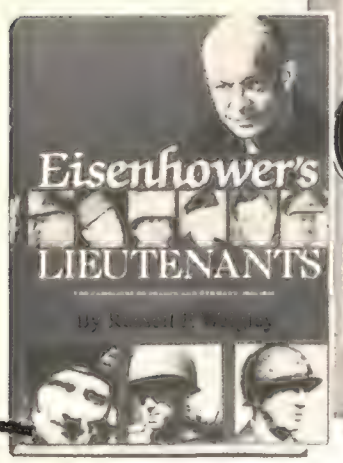

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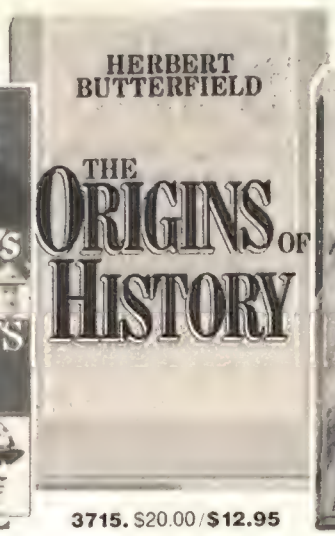

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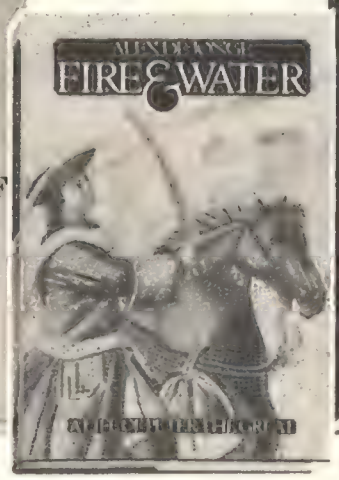

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Letters to the Editor

Eagles and the Great Seal

Dear Sir: I am surprised that Jim Doherty, writing for your May issue from rural Wisconsin, is not familiar with a real "war eagle": Old Abe, the famed mascot of Company C, 8th Wisconsin Volunteer Infantry [below]. One of the men in the regiment had acquired the bird from a tavern owner, who had bought it from a farmer, who had traded a bushel of corn to Chief Sky of the Chippewas, who had captured him as a fledgling. Abe was a real pet and followed his master even into battle, going through 36 engagements and being wounded twice, at Corinth and Vicksburg. When the shooting started, he would soar aloft, his eyes flashing, and would scream with wild rapture. Old Abe was far from being Ben Franklin's cowardly bird.

Mustered out in 1864, he lived peaceably for 17 years in the Wisconsin State House, where he died in 1881. The last I heard, Abe, stuffed, was on display in the Wisconsin State Museum.

Owen J. Remington
Lancaster, Virginia

Alas, Abe is no more. When the capitol burned in 1904, Abe went with it. Ed.

Dear Sir: The rules of heraldry specify that charges, or symbols, must be depicted always facing dexter, or to their right. Probably owing to lack of this knowledge, the left-facing eagle of the Great Seal on the Salem Custom House was in error.

Hardy C. Derx
Hastings-on-Hudson, New York

Tibet's sacred mountain

Dear Sir: Raghubir Singh's fascinating account of his pilgrimage to Mt. Kailas is reminiscent of the journey Dr. Sven Hedin, the noted Swedish explorer, made there in 1907. Despite the frantic warnings of natives that they would be pulled down by the lake god and never survive the trip, he and two Tibetans rowed for 18 hours across Lake Manasarowar. Hedin speculated that he and his companions were the first mortals ever to behold Kailas (*Kang Rinpoche* in Tibetan) by sunrise from the middle of the lake. He was so impressed by its beauty that he wrote, "I could have stayed there for years, watching the ice extend its roof across the depths, the winter storms driving whirling snow across land and water, the approaching spring breaking up the cover, in its turn being succeeded by the temperate summer winds, heralded by the dependable flocks of geese. . . ."

Harry W. Clifford
East Orange

Dear Sir: For some years your articles and photographs have revealed the world, the universe and myself to me. However, nothing has been so emotionally revealing as the marvelous photograph of the Tibetan pilgrim's devotions on page 101 of the May issue. I gazed at the picture, knowing somewhere within me that this is how human beings should be: no racial or sexual or political parochialisms, with none of our arrogance or inequities.

Margaret E. Tomm
Hermitage, Pennsylvania

First airmail service

Dear Sir: Unquestionably, it was Major Reuben Fleet, officer-in-charge of the Aerial Mail Service, who really got it off the ground while Captain Lipsner agonized over all that might go wrong. Perhaps Lipsner's anxiety was prompted by trying to remember what he had been assigned to do.

Major Fleet, in an article marking 50 years of airmail service, recalled: "I had delegated Capt. B. B. Lipsner, who was not an aviator, and had been detailed by Air Service Production at his request to the Aerial Mail Service, to have aviation gasoline at the Polo Field in Washington. He failed in his mission and didn't have a drop. . . . We drained gasoline from a British airplane and two other American airplanes that were on the field, and filled the aerial mail airplane."

Reuben Fleet got into the aircraft-manufacturing business soon after World War I. His Consolidated Aircraft Corp., of which he was president, chairman of the board, chief designer and head test pilot, produced the best military trainer in the 1920s and '30s (the PT-1 and -3), the famous "Catalina" seaplanes (PBY-1 through -5) which served so well in World War II, and the even more famous B-24 "Liberators." (Consolidated became Convair, now a division of General Dynamics.)

Harry C. Winter
Ann Arbor

Dear Sir: As an employee of the U.S. Postal Service in Weed, California, imagine my surprise upon reading your

Old Abe, on patriotic perch, with 8th Wisconsin color guard at Vicksburg, 1863.

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article about Aerial Mail to find that the beautiful mountain I see out the window has mysteriously been moved to the Rockies. For your information, the tall peak shown on pages 86-87 is Mt. Shasta in Northern California, 14,162 feet; the lower peak in the center is Shastina.
Richard E. Negro
Weed, California

Rocky Mountain Biological Lab

Dear Sir: I wonder how many of your readers noticed that the rainbow on the left in the picture on page 127 is a reflection; its colors are blue-yellow-red whereas the other is red-yellow-blue, a true rainbow. Many years ago, crossing Blue Mesa not far from Gothic, we saw a triple rainbow. The third one was very dim, red-yellow-blue, and I assume it was a reflection of the second, which was very visible and the reverse of the first, brightest rainbow.
Howard H. Hottes
Grand Junction, Colorado

'Emergent' artists

Dear Sir: As a well-known older sculptor from Region One (my work is known as far as Epping, New Hampshire), I have a few comments on the selection of artists for grants. In looking over their various offerings one is struck by a total lack of vision. They seem to be mucking about with their eyes raised no higher than the second clasps from the tops of a pair of galoshes.

Turning the pages, one then comes to the pilgrim's return to Kailas and Lake Manasarowar, which have inspired the art, the architecture, the literature and the life of two of the world's great civilizations. Would that the "emerging" artists had such vision.
Cabot Lyford
Exeter, New Hampshire

Dear Sir: Some of these people seem to be into glorified recycling, which may inspire me, a nonartist, to work on *Front Seat International, 1962,* yet. But both Marsha Burns and Richard Shaffer have created something beautiful.
Virginia McLaughlin
Roseburg, Oregon

Dear Sir: I'm getting close to half a century as an amateur observer, collector, critic and dabbler in art. My reaction to your article is "You've got to be kidding!" It looks as if, along with Johnny's not being able to read, he needs remedial help in art skills. Maybe there is reason for the lack of attention given these artists.
Karen White
Plano, Texas

Jumbo

Dear Sir: Although Jumbo is memorialized around the world, one special monument is a mountain which the University of Montana in Missoula claims for its own. Looming over the campus, its long, deep crevasses create the appearance of an elephant complete with trunk, floppy ears and tail. Appropriately and affectionately, this special mountain is known as Mt. Jumbo.
Thomas J. Hallsten
St. Paul

Phenomena

Dear Sir: Cosmic-shot patterns of neutrinos, photons, protons and electrons? Dear me! I read the latter half of your April column underneath my dining-room table. It was disquieting to say the least. Therefore, on reading your May column it was a relief to find that I am so full of wide-open spaces the chance of being hit by any of these cosmic menaces is really quite remote. But now my problem is how to quell the fear that all my vital body fluids will suddenly depart for other wide-open spaces, as there seems to be so little holding them in. It is all most unsettling!
Charles R. Perry
Nashville

Dear Sir: Mr. Wiley writes ". . . we come to realize that the universe is essentially empty." Don't worry, John—the writers will fill it up.
Dick and Peg Nemo
Toledo

Masquerade

Dear Sir: Yes, Virginia, there is a chemical symbol "W."

What an affront to tungsten. Not only was its symbol, W, not used in Mr. Williams' riddle (NOUU rather than NOW) but Mr. Shenker asserts that it does not exist. With an atomic weight of 183.85 and a number of 74, this rare but useful metal, sometimes called wolfram, affirms its existence.

And yet it must suffer this ignominy. It all seems a little hare-brained.
Frank H. Adams
Lake Alfred, Florida
Kit Williams explains: "I used the 1911 Encyclopaedia Britannica *and as far as I'm concerned there are still only 92 elements." Mr. Shenker adds: "As far as I'm concerned, I don't even use the 1911* Britannica *and my chemistry is so backward that I acknowledge only four elements: earth, air, fire and water." The 1911* Britannica *suggests Mr. Williams check Vol. 9, p. 257, for W = tungsten.* SMITHSONIAN *pleads no contest.* Ed.

Yes, we have no tomatoes

Dear Sir: Saved! Was all set to have another go, but sat down and read your article, breathed a sigh of relief and immediately threw out the roomful of milk cartons waiting for the grand planting.
Mary Theodosen
Garretson, South Dakota

Dear Sir: I regret to say this, but tomatowise, Charles R. Larson just doesn't know his onions.

My husband knows all about growing tomatoes, the proof being that each year, come August, we have thousands of tomatoes rotting away in perfect harmony in our backyard. The reason for this red bounty is my husband's knowledge of the psychology of the plants: they are masochists. Anyone who treats them kindly will fail. They don't need water, plant food and fancy outfits, as supplied by Mr. Larson. They thrive on neglect.

Plant them in a foot of mulch (grass clippings my husband is too lazy to dispose of properly), sneer at them as they gasp for water after a two-week absence of rain, snicker when they grow and require stakes, and you have the Richard Leach secret of tomato farming. They love it.

I do not preserve, neither do I can. If Mr. Larson is available at 12 noon, August 15—for that is when they will all come to perfect ripeness—tell him to drop by with wicker baskets. Tell him to take care as he pulls into the drive: the tomatoes will roll out to meet him and the pulp makes the macadam slippery.
Jodi Leach
Joppa, Maryland

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Phenomena, comment and notes

This is the 'age of information,' all right, but then it always has been. In the final analysis, it's all there is

In this era of microchips, computer linguistics, artificial intelligence, and multichanneled multimedia, we tend to be awed and intimidated by what has been widely heralded as a new "age of information." We hear a lot, too, about the psychological and social trauma we are bound to experience in adapting, as we must, to the new "information economy."

Remember Molière's Monsieur Jourdain, who, in his belated encounter with the formalities of prose, was astonished to learn that prose was what he had been speaking all his life? We may, as a species, be in exactly M. Jourdain's position with respect to information. I would like someone to point out to me an age in human history that was *not* an age of information, or an economy that was other than an information economy. As for the increasing percentages of the working population calculated to be engaged in "information handling," what else are the rest of us handling if not information?

When you come right to it, information is all there is. Consider a Beethoven symphony. We all "know" what a symphony is. Yet we are hard pressed to define it. A Beethoven opus was once merely a set of reverberations through the neuronal networks of the composer—pure information —"heard" only internally by that increasingly deaf genius. He translated the information into musical notations so that it could be stored on paper; thus others trained in the code could read and "hear" it in *their* minds. Without the music ever having been played, one could still have held up those notations on paper and said, "This is a Beethoven symphony."

When the symphony is played by a full orchestra in a concert hall, a listener can say, "This is a Beethoven symphony," without reference to any musical notations. When the performance has been recorded, one can then hold up the disk or tape and say, "This is a Beethoven symphony," the information this time translated into a radically different language and stored in a radically different medium, but nevertheless recoverable as the recognizable entity, the Beethoven symphony. If played in the living room, it again becomes the music itself, though neither orchestra nor musical notations are anywhere in evidence—only the vibrations impinging upon the eardrums and cochlear fluid for transmission to the brain. So what *is* the Beethoven symphony? It can only be defined in terms of

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information. It is the information, nothing more, nothing less.

Consider Luciano Pavarotti's voice coming over the radio. Is it a voice being transmitted? No; it is only information about the voice transformed into electromagnetic waves at one end, sent through the atmosphere, captured and reconstituted at the receiving end. If you want to *see* as well as hear Pavarotti singing, two-dimensional information must be extracted, transmitted and reconstituted, information much greater in quantity and complexity. Color requires still more.

Would it ever be possible to transmit information in *three* dimensions? Some futuristic dream spinners have entertained the suggestion as an eventuality not to be dismissed out-of-hand. Theoretically, if ways could be devised to extract *all* the pertinent information—electronic, atomic, molecular, holistic—about a given object, including a human object such as Luciano Pavarotti, then it might be possible to transmit that information as we now transmit a radio voice or a TV image, and reconstitute it at the other end.

To return, however, to our supposedly less bizarre everyday reality, consider a shaker of salt. If you look at a periodic table of elements, you will see that sodium is a highly reactive, poisonous element. Chlorine, too, turns out to be a highly reactive, poisonous element. Yet, bring them together and you get sodium chloride (the salt in your shaker) which is not only unreactive and nonpoisonous, but which you can't live without (although too much of it is bad for you). And all you've done to bring about this miraculous transformation is to rearrange electrons—or, rather, allowed them to rearrange themselves. You have merely rearranged the *information* without adding any new elements or particles at all.

The slight rearrangement of electronic information makes a radical difference in the quality and behavior of the resulting product—*i.e.*, the newly packaged information. When you detonate a nuclear bomb, you are simply rearranging the information; it makes no difference to the universe (however much difference it may make to us) whether the mc^2 happens to be packaged as matter or as energy. As the Pythagoreans once contended, all things are numbers.

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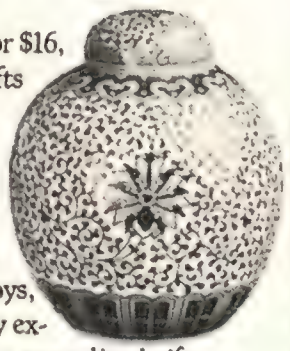

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existing information, consider the genetic code, with its three-letter words (each representing an amino acid, to be strung together into complex strands of protein). One can make an almost perfect analogy with three-letter English words. Some arrangements specify words; others do not, depending on their order. Take three letters like ODG; arranged this way, they do not spell anything; rearrange them to DOG, and a picture immediately arises; rearrange them once more to GOD, and you have an entirely different order of abstraction.

Consider the nature of any object: a table, a book, a tree. We accept that it is made of atoms, that is, of mostly empty space; the solidity and continuity are the constructs of our sensory apparatus interacting with the "objects," which is another way of saying information interacting with information. We further accept that these atoms are *all* rearrangements of the same sets of particles (again, information) in restless motion, fixable in space-time in terms of the "probability waves" of quantum theory. In a word, when you probe down to the heart of the matter, there is no heart of the matter. Only information.

Let me assure you that all the foregoing was not intended to lend a mystical aura to the word "information," but rather to *demystify* it, to counteract the notion that information is a magical new presence somehow sprung newborn into the world. If we recognize that the world is made up of information, and that we have been dealing with information throughout human history, we are less likely to be intimidated by announcements that we have now entered some strange new "age of information."

Even before history began, information handling was a major human occupation. A woman of the Pleistocene era, out gathering food for her family amid the surrounding dangers, certainly had to possess and process impressive quantities of information. So did her mate, who was perhaps at the same time out hunting a saber-toothed tiger, or maybe fleeing from one. In either case he had to be manipulating a great deal of information, instantaneously and simultaneously.

It is only in relatively modern times that the mathematicians, scientists and natural philosophers have contributed such large quantities of information, and

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of so diverse a nature; and only in our time that we have invented "information theory," and broken down information into bits, the better to feed it into the machines that handle such vast quantities of it with such astonishing rapidity. Nevertheless, in all past ages, monarchs and high priests have maintained their power through the manipulation of information. Scribes and accountants, artists and craftsmen, even the most humble hewers of wood and tillers of the soil have lived in information economies and have survived in accordance with their adeptness at handling information.

In fact, we have lost much of the information they possessed, for the most part, probably because we no longer have need of it; though I suspect—along with the New Alchemy movement and the publishers of *The Whole Earth Catalog*—that some of it would be worth relearning. In many ways we have *less* information to deal with than our ancestors, depending of course on our individual occupations, our stations in life, our tastes and lifestyles. Certainly we need much less information to keep ourselves fed, clothed, sheltered and in reasonably good health than people did in past ages.

Our current "information economy" *frees* most of us from having to deal with enormous amounts of information people in previous centuries couldn't live without. The fact that we can afford to do so many things our historical predecessors could not is not because we have each learned personally to handle more, or more complex, information, but because we have specialists and machinery—notably, of course, computing machines—to handle it for us.

It is not that I am so fatuous as to imagine that, by averring that the world is (and always has been) made of information, I have disposed of the problems arising from the contemporary proliferation of information. I am aware that much is genuinely new information, often possessing dimensions unknown to past generations. But I think that my way of looking at information helps to put it in perspective. There is a real danger of an us-and-them split in society between those who, by definition, understand information and those who do not—which can be freely translated by the suspicious as the controllers versus the controlled. We have already seen the rise of antitechnological, almost Luddite sentiment, especially among young people.

Some of the worry about the potential abuses of computerization is justified, a point I won't belabor here. But much of the worry is *not* necessary, and many of the felt overtones of menace that emanate from computers derive from the belief that "information" is something radically new and different. The information specialists have contributed in no small portion to this myth. By repeatedly invoking the new information terminology, they have perhaps unwittingly conveyed the impression that they perceive themselves to be celebrants of some new mystery cult, somehow separate from the rest of knowledge and the rest of history, with the computer at its center. The high-priestly stance is not taken consciously, of course, which is why I take the liberty of gently reminding us all that information has always been the world's most common commodity—and constituent!

Albert Rosenfeld

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Around the Mall and beyond

This is the month for remembering the national past—our birthday month. We Americans got so weary with the anniversary concept at the time of the Bicentennial that some of us were tempted to wonder if all Fourths of July would thenceforth be marked merely by a desultory gesture—a knee-jerk parade of Scouts, an elbow-jerk wave of the flag. But not only has the Glorious Fourth come back vigorously, we are now finding ourselves smothering in an avalanche of even more bicentennials and other anniversaries. We are reminded by the United States Capitol Historical Society that this year, for example, is the bicentennial of the Great Seal of the United States (SMITHSONIAN, May 1982).

Bursting with national fervor, I climbed Capitol Hill to meet Cornelius W. Heine, executive secretary of the society, who had agreed to show me not only the medal his organization is offering the public (at a price), but the U.S. Capitol itself. Mr. Heine met me appropriately at an information desk within the great structure, led me to the House dining room and filled me with a mixture of Texas chili and Capitol lore.

The medal is the newest of those offered by the Historical Society. It's very handsome: a profile of George Washington, 250 years old, on one side, a design of the Great Seal, 200 years old, on the other.

The Capitol unfolded before me as Mr. Heine gave me the kind of tour that his society puts on for visiting school kids. I had never before seen the old Supreme Court chamber, used until 1935, nor the plaques on the floor of the old House chamber showing where Lincoln sat when he was a Representative, and where John Quincy Adams used to rest at his desk, his hand shading his eyes—apparently napping. Actually, the story goes, he was listening to every word the opposition members were whispering among themselves, secrets which, thanks to the echo-chamber effect of the ceiling, bounded straight into the ex-President's ear.

Anyone who likes museums will suddenly be aware that the Smithsonian is by no means the only show in town. The Capitol is a repository of tangibles and memories no museum can quite match. Its ghosts are even livelier than ours.

All through the 1980s we can expect various other anniversaries to be at our throats. Consider: the Constitutional Convention took place in 1787. The first Congress under the Constitution met two years later. The original states ratified the document between 1787 and 1790.

Other states mark centennials in this decade: Montana, the Dakotas and Washington, all having entered the Union in 1889. We even face a 400th anniversary—a quadricentennial, it says here—in North Carolina. Sir Walter Raleigh's attempt to establish a permanent settlement on Roanoke Island began in 1585 (after a preliminary landing the previous year). The colony was abandoned in 1586, restarted in 1587 and finally discovered to be mysteriously deserted in 1590.

Meanwhile, over at the National Zoo, there's a new plaque thanking the Chinese people for the pandas. They've been in their establishment, happy though unreproductive, for ten years.

However endangered the pandas may be —or blue whales, or snow leopards, or California condors, or giant sable antelopes—they are at least hanging on. Dinosaurs let go a long time back. But it's notable that these were by all odds the most successful creatures on land. They lasted 140,000,000 years as compared to Man's measly two or three million—so far.

Such are the musings of Michael Brett-Surman who is part museum technician at the Smithsonian, part doctoral candidate, and the lively teacher of Geology 150, a summer course at the George Washington University which begins later this month. "Dinosaur Mike," who is tall and lean but does not have as long a neck as a *Diplodocus*, claims that his is the only course just on dinosaurs by someone who really knows, loves and specializes in dinosaurs. He gets into the history of

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dinosaur paleontology and also how to dig up a dinosaur. He talks about the evolution of the creatures and their extinction. He plans to take his students on field trips to see and collect fossil plants near Washington and to shepherd them through the Smithsonian collections with unaccustomed care. His tests are open-book. He asks questions such as "How many Ayatollah Khomeinis would *Tyrannosaurus* have to eat in a year to keep alive?" The answer: about 18 for a teen-age dinosaur.

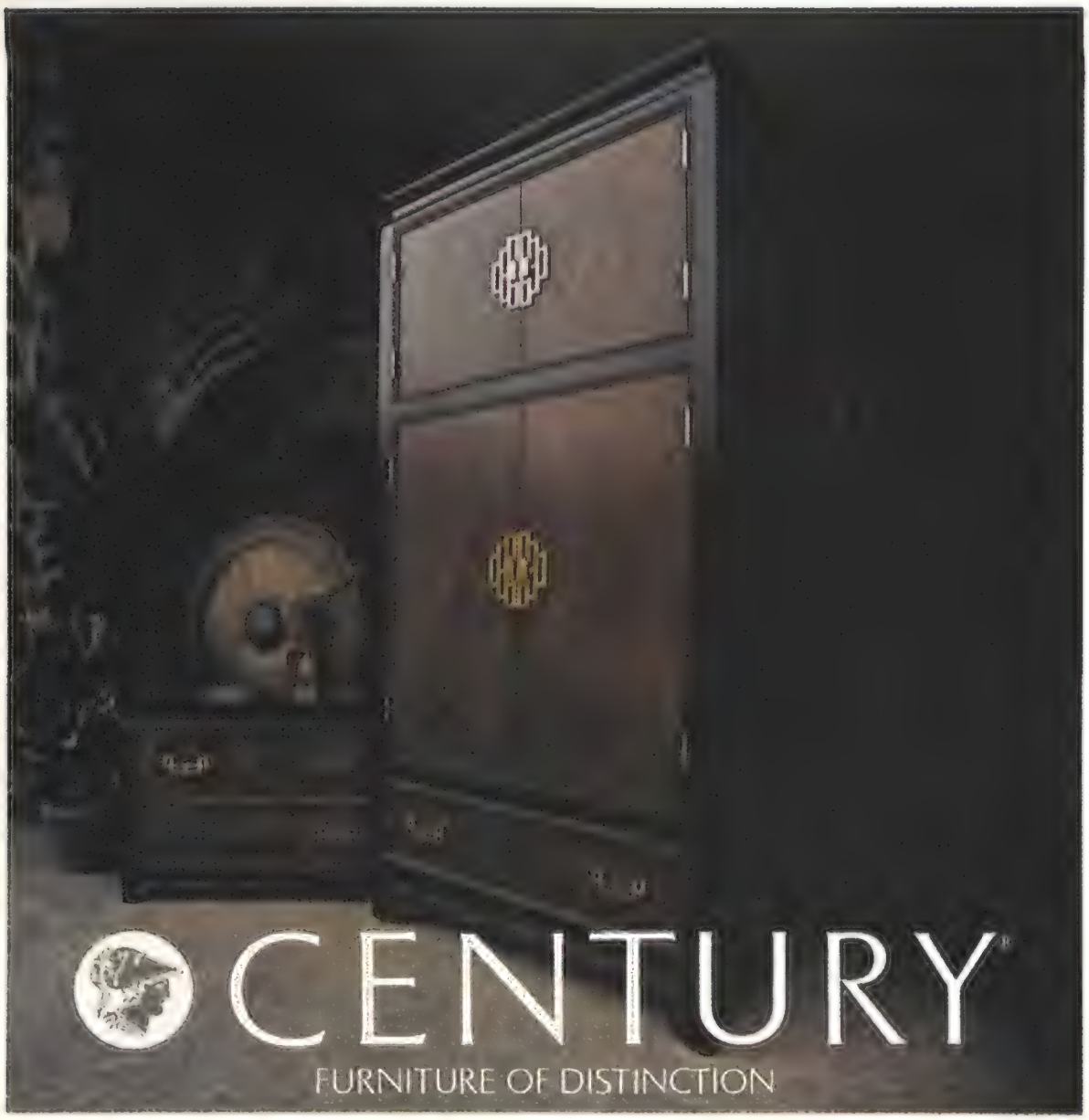
I suppose the desire to improve a city is a sign of civilization. Ancient Rome went through it: erecting new buildings in the reign of Augustus, changing the look of the city (to paraphrase the emperor) from brick to marble.

Last March a group of architects and other interested folk were invited by the Resident Associates and the American Institute of Architects to play a sort of game with the city of Washington. Take a nothing street and make something out of it—a livable neighborhood or a meaningful site. The seminar drew a near-stampede of students, lawyers, city planners, architects, faculty members of universities—lots of people besides architects. They came from all over the country and beyond, and they ended up putting on an all-day charette, or intensive work session, in which they performed magic on a three-block stretch of rather blighted streetscape, adjoining the National Portrait Gallery and the National Museum of American Art.

The results were remarkable: move the Supreme Court to the street; put in trees and shrubs; include a pedestrian mall with artistic paving stones; have set-back terraces; give it ethnic character; slap in a village green . . . all of these and more were ideas that came from the planning teams. Maybe nothing will ever happen, but the "Design Seminar" proved one thing: concern.

Spring on the Mall was brief this year, its inception slowed by a reluctant winter, its demise hastened by an eager summer. Yet it achieved memorable moments.

I had wandered out on the Mall one noon to stroll and bask and munch popcorn. Eventually I entered the Hirshhorn's lower level and was intrigued by the sound of an old-time movie-house piano, tinkling out a ragtime tune to accompany stills from silent flicks. It was



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Many people say they know the facts, but they still don't wear belts. Their reasons range all over the lot: seat belts are troublesome to put on, they are uncomfortable, or they wrinkle your clothes. Some people even think getting hurt or killed in a car accident is a question of fate; and, therefore, seat belts don't matter.

If you're one of those people who don't use belts for one reason or another, please think carefully about your motivations. Are your objections to seat belts based on the facts or on rationalizations?

Here are a few of the common rationalizations. Many people say they are afraid of being trapped in a car by a seat belt. In fact, in the vast majority of cases, seat belts protect passengers from severe injuries, allowing them to escape more quickly. Another popular rationalization: you'll be saved by being thrown clear of the car. Here again, accident data have proved that to be untrue—you are almost always safer inside the car.

Some people use seat belts for highway driving, but rationalize it's not worth the trouble to buckle up for short trips. The numbers tell a different story: 80% of all automobile accidents causing serious injury or death involve cars traveling under 40 miles per hour. And three quarters of all collisions happen less than 25 miles from the driver's home.

When you're the driver, you have the psychological authority to convince all of the passengers that they should wear seat belts. It has been shown that in a car, the driver is considered to be an authority figure. A simple reminder from you may help save someone's life.

Another common myth: holding a small child in your arms will provide the child with sufficient protection during a crash. The safety experts disagree. They point out that even during a 30 mph collision, a 10-pound child can exert a 300-pound force against the parent's grip. So please make sure Child Restraint Systems are used for children who aren't old enough to use regular seat belts.

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Albertosaurus, left, meets *Styracosaurus* on lecture program.

part of the recent De Stijl show, a way to get you into the mood of that period.

The nice jumpy tunes were echoing inside me when I went outside again into the sunlight. And then from the carousel came a beer-garden waltz from the Gay Nineties, *Sweet Rosie O'Grady* or something. I hummed along as I set course for the castle. But I veered off to investigate a crowd of people gathered by a trailer.

Music was coming from this, too, and suddenly it supplanted the carousel and caught me right in the nerve ends: Dixieland jazz. A splendid group of seven, calling themselves Southern Comfort, was belting out *Hello Central, Give Me Doctor Jazz*, and I was done for. Forget the job, the wife, the family, the threat of unemployment and disgrace and contempt. Just listen to that clarinet move up and away while the bass lays the keel!

Alec Templeton, the blind pianist of the '30s and '40s, made a record in which he imitated the sounds you would hear if you walked down a corridor in a music conservatory, passing various studios and rehearsal rooms. It was a jumble of piano scales, twittering sopranos, brass-lunged altos, nasal tenors and grumbling baritones, all attacking quite different pieces of music. Now I recognized the same sort of cacophony: that cheerful, sassy piano, then the calliope sounds, and finally this.

The banjo player was leading a New Orleans version of the old hymn, *Just a Closer Walk with Thee*, very slow and mournful (on the way to the graveyard). Then the funeral procession headed home. The band found a beat and the other instruments joined in—cornet, drums, piano and what Eddie Condon used to call "tramboon"—hard and clean, climbing all over the old tune. What a way to die and go to heaven!

A Washington department store had teamed up with a radio station to bring the Southern Comforts to the Mall and other bands to other parks. A rite of spring, no less. No matter how hard we try to avoid it, we Americans are getting civilized!

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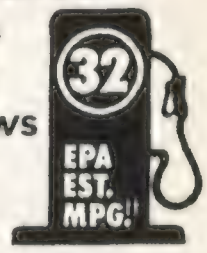

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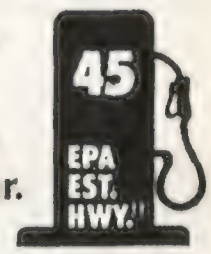

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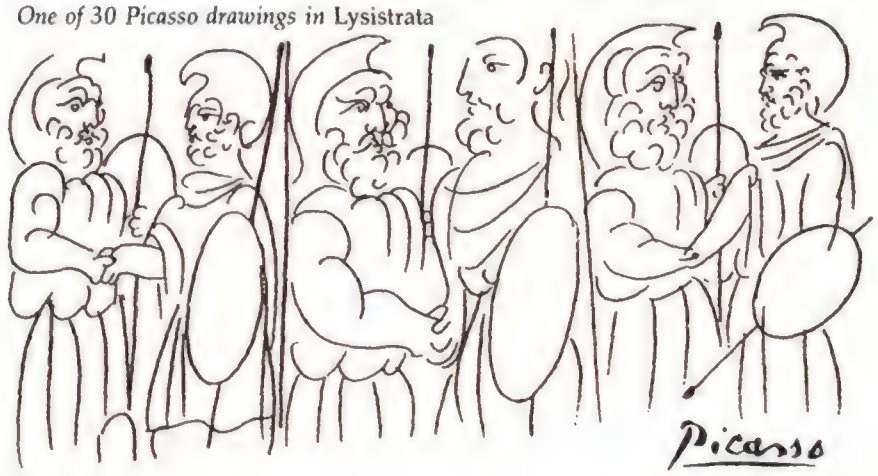

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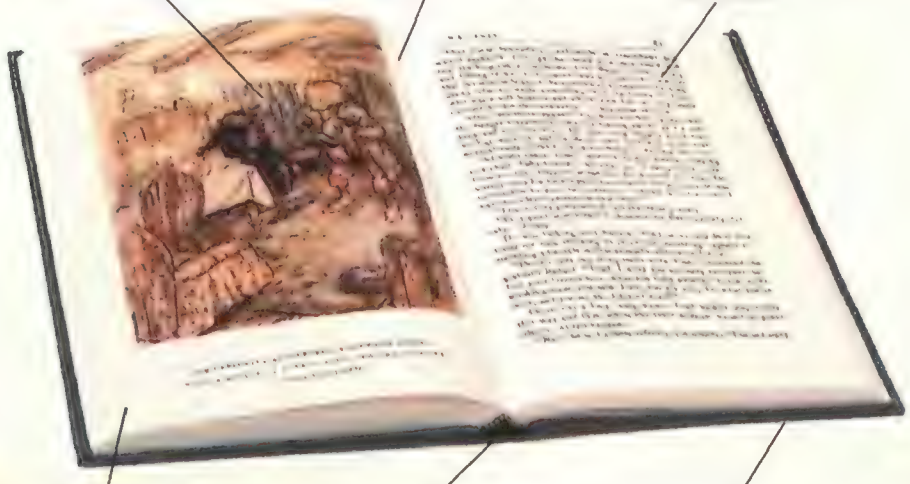
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By William H. MacLeish

The United States Coast Guard: poor, but proud and looking ahead

The 'Coasties' rescue 7,000 people a year, form the world's largest marine police force, and juggle dozens of other missions as well

The ocean is impossible. Waves rear to more than 40 feet and break full on the yacht's hull. Winds strong enough to shred the surface pin the small sloop on her side. Suddenly she capsizes, throwing the one man aboard her over the side. Just as suddenly, three men riding tandem aboard a strange new motorized inflatable boat slide over a comber and haul the doomed yachtsman to safety.

That rescue, off Cape Fear, North Carolina, last fall, brought congratulations from Coast Guard headquarters to the cutter *Alert* and medals to the men who manned her "rubber ducky" small boat. A fine example, the local people said, of the Coast Guard doing its job.

Americans close to a coast share a warm feeling for those sharp-prowed white vessels with the red racing stripes. We may have missed news of the *Alert*'s exploits, but when we run out of gas off Galveston or the family 16-footer is late returning to Montauk from an island picnic, we know whom to call.

And we do, tens of thousands of us. In each of the Coast Guard's 12 districts, duty officers in scores of control rooms listen to the worried, the hysterical, and try to determine what response is required: a fast patrol boat, a helicopter, a fixed-wing aircraft, a cutter, or just reassurance. All told, our calls produce more than 80,000 SAR (Search and Rescue) cases a year in which the lives of almost 7,000 people are saved. No wonder that in the minds of many, the Coast Guard motto *Semper Paratus* translates as: always prepared to pull someone out of the soup.

A 41-foot patrol boat, workhorse of Coast Guard rescue operations, speeds to answer a call in Boston Harbor.

On patrol in the Yucatan Channel, a Coast Guard lookout uses "big eyes" binoculars to find drug boats.

But that's not all by half. While lifesaving is basic to the Coast Guard's existence, it is only one of so many missions that even the service's chiefs have trouble explaining them to the public. The world's largest search-and-rescue outfit is also the world's largest marine police force. Boarding parties leave cutters almost every day to search for illegal catches or equipment aboard Communist-bloc processing ships in Alaskan waters or Japanese long-liners off Cape Cod.

Photographs by Marcus Halevi

Coast Guard National Strike Force Dive Team assists at scene of plane crash in Potomac River last winter.

Or they stop shrimpers, sloops and coastal freighters to look for marijuana, cocaine, Quaaludes and other items of an illicit trade now so pervasive that contraband drugs may rank second in value behind oil among our imports.

Multimission is the Coast Guard's byword. During their careers, most of the 40,000 "Coasties," about 1,700 of whom are women (there are also some 5,000 civilian employees), rotate through such broad-gauge activities as SAR, law enforcement (called ELT, for Enforcement of Laws and Treaties) and aids to navigation—the operation of more than 40,000 buoys and beacons at sea and on inland waterways, as well as hundreds of long-range electronic navigational aids. The Coast Guard, one of our regular armed services, operates under the Navy Department during wartime, so readiness training is part of the equation. It conducts much of the nation's ice breaking in ports and all of it in polar areas.

Other more specialized missions, most of them regulatory functions assigned by federal legislation, lengthen the list: protecting the marine environment from sewage, oil spills and other pollutants; inspecting design and safety features of all manner of vessels—offshore drilling rigs, production platforms, tankers, container ships and pleasure boats; and insuring security of ports and waterways, including traffic control and the monitoring of hazardous cargoes like toxic chemicals and volatile fuels.

To do its many jobs, the Coast Guard deploys its people from the Bering Sea to the Caribbean, from the Great Lakes to the mouth of the Mississippi, from boot camp at Cape May, New Jersey, to the service's academy at New London, Connecticut. Shore-based units of all kinds number almost a thousand, not counting the Coast Guard Reserve and the Auxiliary, a group of volunteers assisting the regulars in boating safety and rescue. Two hundred and forty-six cutters are in the inventory as well as 2,100 small boats, 55 aircraft and 116 helicopters.

They are not enough. To carry out what Washington has assigned it, the Coast Guard has dug deeply into its capital: the training of its personnel and the upkeep and upgrading of its fleet. Last fall, the staff of the House Subcommittee on Coast Guard and Navigation released a detailed study of its charge. The report's findings are summarized in its title: "Semi-Paratus: the United States Coast Guard, 1981," an obvious play on the service's motto.

Congressman Gerry Studds of Massachusetts, the

William H. MacLeish, on leave from the Woods Hole Oceanographic Institution, is at work on a book about oil exploration and fishing on Georges Bank.

subcommittee chairman, has been hammering away at shortfalls. Though reenlistment rates among enlisted men are coming up from basement levels, he says, most have fewer than two years' experience in a service that places unusual reliance on the judgment of its lower ranks. (A coxswain of a small boat or rescue craft is the skipper of his vessel no matter what his rank.) The number of cutters has declined by almost a third in the last decade, a period when Coast Guard responsibilities have been proliferating, and the average age of a cutter is now about 23 years. "I for one," Studds told his House colleagues, "am tired of stories about Coast Guard vessels so decrepit they cannot be put to sea. . . ."

As part of its efforts to cut government spending, the Reagan Administration has proposed reduced funding in many categories of the Coast Guard budget. Members of Congress of both parties have fought to restore cuts in key areas and to make sure that those monies are spent rather than hoarded against uncertain times. Coast Guard leaders have unstiffened their upper lips and begun speaking out about their plight. Admiral John Hayes, who recently stepped down as Commandant, has been exceptionally candid. "We cannot expect our people," he told Congress last year, "to continue responding reasonably under unreasonable conditions."

If one goes by the adage that success has many fathers, then the Coast Guard, historically at least, is a smash hit. It has inherited its missions from New England lighthouse keepers, from volunteers rowing out to square-riggers ripped open on the rocks, from the examiners in St. Louis who gave Mark Twain his steamboat-pilot's license and, foremost among forebears, the men who sailed the nation's first fleet.

Lighthouses and revenue cutters

Chronologically, the story could start with the lighthouses, the first of which was built near Boston in 1716. Others followed, on particularly nasty headlands, until in 1789 Treasury Secretary Alexander Hamilton proposed the creation of a federal lighthouse service to guide America's merchant marine. That turned out to be our first public-works bill. To bolster shipping, Hamilton asked for and got a Revenue Act from Congress favoring the import of goods in American bottoms, plus the funds to build ten cutters—fast and maneuverable schooners 40 feet or so at the keel. This was the Revenue Marine, later called the Revenue-Cutter Service, and its mission was to enforce Hamilton's tariffs and go after smugglers. Its officers held military rank. Since then cutters have fought in every war, from that of 1812 to the "brown-water" war in Vietnam.

The odd juxtaposition of clenched fist and helping hand runs straight through the Coast Guard's history. It is in the original version of the marching song: "*Semper Paratus* is our guide, Our fame, our glory too, To fight to save or fight and die! Aye! Coast Guard, we are for you!"

Lifesaving worked its way into the fabric of the service from the beaches. Lighthouse keepers often doubled as rescuers. As more and more merchantmen and immigrant packets were wrecked along American coasts, groups of men got together to do what they could about the survivors. The Humane Society of Massachusetts was among the first.

Revenue cutters did their share of rescue work, particularly after 1837, when Congress authorized the President to cause "public vessels . . . to cruise upon the coast, in the severe portion of the season . . . to

Boarding party guards crew while seized vessel is searched; 20,000 pounds of marijuana were discovered.

afford . . . aid to distressed navigators. . . ." Cutters often little if any more seaworthy than the merchant fleet went looking for storm victims and found them. They rescued some 15,000 survivors of sea combat during the Second World War. In the years after that, until jet aircraft made transoceanic flight routine, cutters lay in midocean, functioning both as beacons and standby rescue units. In 1947, the *Bibb* (still in service) guided the *Bermuda Sky Queen* to a crash landing nearby and took aboard all 69 of its passengers. The Coast Guard was on hand only hours after the liner *Stockholm* knifed into the *Andrea Doria* in 1965. And in 1980, in the largest operation of its kind, it worked with the Canadians to take passengers and crew off the cruise ship *Prinsendam*, afire off Alaska.

Yet, lifesaving today is still run largely from shore stations. Small cutters and patrol boats in inshore waters account for 80 percent of SAR cases. They are faster and better equipped than the old surfboats. But the men and women who crew them still go by the old surfman's slogan: "You have to go out, but you don't have to come back."

Most of the work is routine. At a typical base, the 41-footers are ready in their slips. A buoy tender lies alongside a dock with a couple of 82-foot patrol boats, named after points of land, and 95-footers, named after capes. A 44-footer, designed to roll and right itself in terrible weather, is up on the ways. Crews tinker, chip and paint. Then word comes from the control room and three young people, a man and two women, break for their boat. The coxswain steps into his tiny cabin and clambers onto his cushioned conning chair. The engine burbles, the lines are let go, and in less than two minutes we're heading out.

Routine. A man from New Jersey out on "Mossbunker Shoal" with a broken propeller shaft. The coxswain eases the throttle forward and the 41-footer climbs a rung of water and starts to plane. Old Glory stretches astern. In half an hour we're threading among the fishermen looking for "New Jersey." Why didn't these boats help? "People should be so nice," says the coxswain.

There he is. Middle-aged, pale-skinned, trying hard not to look scared, not to look silly. "What a vacation," says the man. "When's it over?" asks a crew woman, throwing him the big nylon tow rope. "Now," says the man. The Coasties board and conduct a routine check. They find a fire extinguisher so corroded it wouldn't douse a match. The man shrugs. The patrol boat tows yet another careless citizen to port.

The Coast Guard is looking for more than carelessness. It did not take long for the Revenue Marine to branch out from the basic business of hailing inbound merchantmen and checking cargoes. Some actions, like the suppression of pirates in the Caribbean and Gulf, captured public admiration. But many of the laws the cutters enforced were, and are, at least regionally unpopular. Revenue ships sailed against slavers. They repeatedly closed ports in the early days in response to Presidential embargoes; captains like my great-great grandfather Moses Hillard of Connecticut ranted against the tyrant, Thomas Jefferson, whose policies were ruining their livelihood. Revenue cutters went after smugglers of opium and Chinese coolies on the West Coast. And fewer than ten years after the Coast Guard was created from the merger of the Revenue-Cutter and the Life-Saving services, its ships were in the thick of the "Rum War."

Fighting a losing battle

Prohibition may have been a "noble experiment" for Herbert Hoover but, for the Coast Guard, it was an exercise in frustration. Mother ships loaded with bottles of all brands and qualities lay along rum rows off New York, Boston and other thirsty cities—just outside U.S. territorial waters—and offloaded onto speedboats for the dash to a midnight beach or a hidden inlet. Some rummies were captured. Both sides took casualties. Public sympathy was often on the side of the smugglers. Courts tended to be lenient in some areas. In Boston, Coasties were beaten on the streets.

Though reduced in size after Prohibition, the Coast Guard came out of the Rum War tougher than when it went in. It had acquitted itself well enough so that in 1936 Congress gave the service one of the most extensive grants of police power in the country's history. The Coast Guard became responsible for the enforcement of all pertinent federal laws on the high seas and navigable waters of the United States. Not only could cutter crews board suspect vessels of U.S. registry (and foreign vessels also, at the request or with the permission of the flag state) but they could do so in most cases without a warrant. That exercise of power still does not sit well with some jurists.

In the Sixties, the dry drugs began to appear: marijuana and, more recently, cocaine and a pharmacopoeia of happy capsules. Some came in by plane. But marijuana in bulk required transport by sea. Ergo, the Grass War. The Coast Guard became involved gradually. In 1973, it seized only six vessels. Last year, it took 164. The marijuana they seized had a street value of more than $1.7 billion, close to the Coast Guard's entire budget.

The most successful drug buster last spring was the

Handcuffed to a cable on stern of cutter *Dauntless*, prisoner has lunch during three-day trip to Key West.

Dockworker relaxes on 50-pound bales of marijuana confiscated from *Tiger Rose* (rear) off New England.

Patrol-boat crew member helps sailors right their catamaran, a typical call in the summer season.

Off the Florida coast, crew of a patrol boat prepares to take a disabled Haitian vessel under tow.

medium-endurance cutter *Dauntless*, with more than 50 seizures to her credit. Commander Mike Murtagh, her skipper for the past two years, thinks like a doper. He knows where they are liable to pick up their loads: along Colombia's Caribbean coast or in the islands. He knows their constraints in planning the trip north. *Dauntless* has concentrated many of her recent three-week patrols in and around the Yucatan Channel, the choke point between Mexico and Cuba.

No bust is typical, but the *Daisy Marivel* will serve as an example (p. 36). *Dauntless'* lookout spots it through giant "big eyes" binoculars (p. 32), a small, scruffy boat wallowing along on a northerly heading. Murtagh swings and comes up her erratic wake. Lieut. Larry Yarbrough, the operations officer (whose father had been a "revenooer" in the Southern mountains) uses the loud-hailer to request the suspect's registry. No answer. Suddenly the boat crosses our bow, forcing us to veer off. Two men run from the cabin and throw weighted plastic bags overboard. They could contain guns or cocaine or other contraband whose possession carries stiffer penalties than the three to five years usually meted out for the first marijuana smuggling conviction.

The boat's skipper finally gets on the radio. He doesn't know his country of registry. He is Canadian, he says, and his crew are "of Spanish persuasion." Murtagh grins. There on the transom is the home port: Miami. The boat is eminently boardable.

Armed with .45-caliber automatics, nightsticks, a riot shotgun and an M-16 rifle, the boarding party pulls away from *Dauntless* in one of her two small boats. In ten minutes, Murtagh has the message: the suspect is carrying about ten tons of marijuana in 50-pound bales stuffed in every available space below-decks. No record, but added to the thousands of other bales and plastic pouches seized by the Coast Guard, it translates into 15 percent of the stuff coming north.

The Coast Guard could do much better but is stretched increasingly thin. Two years ago, the service distinguished itself by shepherding more than a hundred thousand refugees from the Cuban port of Mariel to Key West—the SAR case of all SAR cases. But activities elsewhere had to be cut, sometimes drastically, to mount that effort: drug interdiction along the Atlantic Coast went down by as much as 85 percent during the Cuban sea lift. Similar rob-Peter-to-pay-Paul curtailments have been forced by the inflation of fuel prices and the initially experimental but now continuing Haitian-interdiction program (left).

Patrol boat escorts a tanker carrying liquefied natural gas into Boston harbor; all other traffic is kept clear.

Clearly, the Coast Guard does not have the wherewithal to perform the missions it has accepted. One reason why lies in the pace of what it calls "tasking." Between 1970 and 1980, Congress passed more than 30 laws giving new or expanded responsibilities, sole or shared, to the Coast Guard. The decade began with setting of vessel-sewage standards and the safety factors of small-boat construction and ended with rules for inland navigation. The net effect of the legislative loading, coupled with the decline in plant and equipment, has been to transfer Coast Guard men and women from the deck to the desk.

The Administration's passing of a military pay raise and the current recession have helped boost retention rates among enlistees. (Reenlistment among officers has remained high.) But the personnel picture is still not bright. It takes about eight years for the Coast Guard to get real return on its training programs, and not enough people are staying that long.

Some personnel problems are built in. Rapid rotation, long a basic military policy and essential to the multimission concept, clashes with the specialized needs of regulatory activities. A fisheries boarding-party member, for example, needs time to become familiar with fishing grounds and vessels and to accumulate knowledge about relevant laws and treaties, different types of equipment, and the kinds of fish being caught. All that does not come in a year. Overwork is a problem in some units, particularly search-and-rescue outfits, though you don't hear too much about

In a classic rite, a recruit gets his inoculations at Coast Guard boot camp in Cape May, New Jersey.

Preparing for the worst, recruits practice a water-survival technique in base pool at Cape May.

it from the crews. Their gripes have to do with poor housing ashore, lack of medical programs for their dependents, poor training and equipment. And, among the more reflective, the hunt-versus-help syndrome. Time and again, at sea and ashore, Coasties told me: "I joined to save people, not to bust them."

In more than a few instances, the Coast Guard would have a hard time meeting its own safety standards. Repairs have been put off for so long and so often that the key ratio of operating days to maintenance days has been dropping like a stone. Spare parts for old vessels are increasingly hard to find and many have to be custom-made. Reconditioning does go on, but slowly. "What we're getting," says the skipper of a 95-foot cutter, "is already five years old by the time it's installed. I feel silly when I go aboard a Japanese trawler and look at his equipment."

A hand could be lent to the air wing, too. Helicopters are aging and acting up. At Otis Air Force Base on Cape Cod, the Coast Guard operates the last few "Albatross" amphibians in the military, planes built around 1950. They are lovely old birds, high winged and high sided. "These are good airplanes," says a crewman. "They may break on landing or take-off, but never in the air."

Ours performs beautifully, after some headshaking over engine synchronization. We lift easily and head toward Georges Bank to "rig" boats, identifying and inspecting them from 100 feet or less.

"Ten seconds on our right," says the pilot, and a

A recruit stands stiff under intense scrutiny of his company commander, a chief petty officer.

The Coast Guard's many missions

After standing watch aboard *Dauntless*, a crewman relaxes at the rail with a little bluegrass music.

scalloper whips by almost too fast for us to read the identification numbers. We bank hard. "Don't get excited," says the comforting crewman. "Wing struts are the strongest thing we got." A stern trawler is below us, her net coned just under the surface. Then whales, also fishing. A group of gillnetters are setting out. They are close to an area where fishing is prohibited, and we bank again and again for photographs. We make two passes at a small lobsterman suspiciously clean; federal pressures in Florida have forced the dope traffic north.

We turn home, across the forearm of the Cape, watching the bottom sands go from green to gold in the shallows to white on the beaches. The wind bucks us on the way in, and we come down steeply. The prop acts up again. On the ground, the comforter says: "Didn't want to worry you out there, but these things are so old we just don't like to land them in the water."

New equipment and new pressures

New equipment is coming. The Albatrosses are making way for jet aircraft, and a versatile new chopper is due in the next year. The *Bear*, first of the new "Famous" class of cutters, is about to join the fleet, and others will follow. But all told, these are little and late.

It will be a busy decade. The shape of things to come is discernible on the summer sea near any resort. Pleasure boats swarm like water striders on a pond. Many too many people on the water don't know what they're doing. In the control room of the Coast Guard base in Woods Hole, there is a constant clatter of distress. A bluefin tuna has mangled the hand of a sport fisherman. A couple from New Jersey can't get their transmission into forward. "Can't you get home in reverse?" asks the duty officer. Evening comes, and with it the frantic calls about overdue boaters. Inevitably, there is a false alarm among the real ones. A 41-footer races through the night fog after a sinking cabin cruiser only to find two kids playing with a radio.

The merchant marine is carrying dangerous cargoes, many in aging ships. When the 23-year-old tanker *Argo Merchant* piled up on the shoals off Nantucket in 1976, members of the Coast Guard's oil-pollution strike team risked their lives repeatedly aboard the vessel as she broke up and in the torrent of oil that poured out of her. New legislation will mean safer ships. But tanker traffic, perhaps from new oil fields far out on our continental shelves, is expected to increase, and so will the threat of accidents.

Even the new and sophisticated vessels pose problems, precisely because of their sophistication. Go out with Coast Guard inspectors to the *Larbi ben M'hidi*, more than 900 feet long, lying off Boston's North Channel with a full load of liquefied natural gas

Strike-team member wears protection at chemical spills.

Tammy Midgett's family has long Coast Guard tradition.

Timothy Bouknight keeps engines running on boat.

Paul Gingras talks to bridge during fire drill.

from Algeria (p. 39). She is a "technoship," a construct of computers, valves and consoles. She is also a potential firebomb. If her safety devices malfunction, if she goes aground or collides with another vessel, no one is sure what might happen. But the educated guess is that if her supercooled cargo were to spill into Boston harbor, and come into contact with an open flame, much of the city might disappear in the resulting fireball. The chances are small, and some of the reasons can be found on the clipboards of the Coast Guard inspectors as they ride the motorized ladder up *Larbi*'s towering side.

A busy decade, indeed. Oil companies are prospecting in deeper and more dangerous waters. Their rigs are proof against most storms, but not all. Witness the capsizing of the giant *Ocean Ranger* off Newfoundland last winter with the loss of more than 80 lives. Deepwater ports for handling ultratankers are coming in the Gulf. Fisheries must continue to be protected. All told, the continental shelf begins to look like a natural arena for resources competition. And guess who the cop on the beat will be?

The Caribbean will continue to be a Coast Guard sea. So will the waters off Alaska, patrolled and protected by the cutters ever since Seward bought it in 1867. (The first *Bear* once rescued winterbound whalers by sending them a party—driving a herd of reindeer for meat—1,500 miles over the ice.) Oil activities are picking up in the Far North. And interest in Antarctica is such that ice breaking probably will pick up there as well.

The same can be said for the Coast Guard's military role. The Navy has adopted a forward-defense strategy that implicitly leaves waters closer inshore pretty much to its sister service. The two have worked together to upgrade some cutters, and the Navy is paying to arm *Bear* and her siblings to complement its own vessels. Yet antisubmarine-warfare equipment is mostly out of date, and even the *Bear* is slow by Navy standards; her top speed is 19 knots.

Something has got to give under the pressures of wartime versus peacetime preparedness, sea duty versus shore duty, lifesaver versus law enforcer, multimission versus specialization. The top brass indicate that for one thing, nonoperational activities will not have the priorities they once did. Commandant Hayes is on record as "opposed to the assignment of any additional regulatory functions." His successor, Admiral James Gracey, carries this determination even further: "I decry the mentality which says: 'We have a problem, let's write a regulation to solve it.' I think we probably went overboard."

At least some responsibilities will be given to others. Ship inspection, for example, might be handled to some degree by the American Bureau of Shipping, an industry group. Bridge inspection (yes, the Coast Guard does some) could go to other agencies. Harbor authorities could be more active in developing and operating their vessel-traffic systems.

Aids to navigation could be reduced in number and automated. Solar power is being used on some right now. And the nation's last lightship, *Nantucket,* is being replaced by a monster buoy 40 feet across. Seamen will miss the red hull, the high light turning, the baritone "free-umph" of her horn. A lightship, however, is not only expensive but a dangerous place to be. This one's predecessor was rammed and sunk with the loss of seven lives by the sister ship of the *Titanic* in 1934. "Nothing's changed," the skipper of the resupply cutter told me as we groped toward *Nantucket*

in a warm October fog. "Incoming traffic still uses her radio beacon to home on. Hell, one [ship] came so close a few months ago," he went on, "that the guys took to the boats."

Boating safety is being picked up by some states, and that process could be accelerated. Perhaps more search-and-rescue work could be performed by the Auxiliary, though there is a limit to what those 43,000 volunteers can be asked to do, especially on a howling January night when the worst is likely to happen and, unfortunately, often does.

The most controversial proposal for the Coast Guard's future is the user fee. The Administration submitted a vaguely worded request in that direction last year and then withdrew it. The idea is being reworked and is gaining support, though critics say that what has been talked about so far would put a heavy load on commercial seamen: fishermen, tug operators and the like. They also argue against the bought-and-paid-for mentality that the fees might generate, replacing current perceptions of Coast Guard services as a public good.

Some form of user fee seems inevitable. Many feel that if oil companies wish to prospect and produce in polar areas, they should conduct or at least pay for their own ice breaking. Similarly, waters serving only a marina or yacht club might be marked by navigational aids at the expense of those users.

Administration supporters insist that the Coast Guard has, like the rest of the government, grown like Topsy and must be reshaped in a more rational way. Any extra funds for the service, the more militant declare, must come out of some other programs run by the Department of Transportation, the service's parent agency, most of which are already suffering from severe budget cuts.

There is a limit to what the Coast Guard can do in its own defense, both politically and psychologically. It is a military organization, possessed of an abiding military conservatism. As one sympathetic Congressman put it, "the Coast Guard is a service that has been an absolute team player with every Administration. They do not make inordinate requests. They take it out of hide. . . . The difficulty is that they have no more hide. . . ."

Most Americans continue to think well of the Coast Guard. You can see that when a patrol boat slides into any busy harbor. People sipping sundowners on their cruisers stand and wave. "Hey! I gotta nephew with you guys." A pretty girl on the dock yells, "I want to join!" Until recently, the goodwill has not translated into political pressure. But when the Coast Guard announced that proposed budget reductions would force cutbacks around the country, the reaction was loud and bipartisan.

No one is predicting how the Coast Guard will fare over time in a process that, after all, involves the entire federal establishment. More attention may be paid to priorities like training and maintenance, procurement, increasing efficiency, and higher levels of military preparedness. Whatever happens, the Coast Guard will be around to celebrate its bicentennial in 1990. "Sure," says Gerry Studds, its most persistent supporter on Capitol Hill, "it may have grown over the years like Topsy, but it has grown into something that is very special."

Flying Santa will deliver gifts to 22 lighthouse keepers, all Coast Guard, throughout New England.

Cutter *Yankton* (top) breaks ice near Cape Cod. Icebreakers work Great Lakes and polar waters.

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PORSCHE + AUDI

By John Canaday

The Greek who bore great gifts to all Mankind

The most important exhibition of El Greco's powerful painting visits the United States and affords a fresh view of his unique genius

About 415 years ago, an unknown, ambitious, cocksure young man in his mid-20s named Domenikos Theotokopoulos left his native Crete for Venice with the idea of changing himself from a provincial painter of Byzantine icons to an up-to-date artist in the Italian galaxy. Over the centuries between then and now, Domenikos' position in art history, under the nickname El Greco, The Greek, has run the gamut, or several gamuts, from obscurity to a degree of fame (spiced with notoriety), from fame to limbo, and from limbo to his present eminence in the all-time front rank of Old Masters—all this with accompanying cycles of understanding, misinterpretation, indifference, antipathy, enthusiastic appreciation, and other contradictory evaluations on the part of critics.

Even among the most consistently admired Old Masters there have been ups and downs of favor over the centuries, but El Greco's history is extreme in its fluctuations. Nor is the long story completed. The latest chapter is a current international exhibition, "El Greco of Toledo," comprising the most comprehensive showing of his paintings ever assembled at one time, which sets out to shift our understanding of his art to a more factual and realistic basis than the romantic one that now prevails with a public that responds to

National Gallery of Art, Washington

Unfinished at the time of his death in 1614, El Greco's *Laocoön* was the artist's only foray into mythology.

A new view of El Greco's genius

El Greco's paintings as emotionalized visions that must have been inspired by mystical ecstasies, perhaps even by morbid religiosity.

The first critics to rediscover El Greco after 200 years of neglect responded in the same way. In 1840 one of the first of these, the French litterateur and romantic esthete Théophile Gautier, wrote of El Greco's "depraved energy and unhealthy power which betray the great painter mad with genius," an evaluation meant to be laudatory and one that, in more subdued tones, persisted for close to a century among other writers on art. Today El Greco, rather than "mad with genius," is seen by critics not only as quite sane, but controlled by intellect. "El Greco of Toledo," based on this premise, completed its inaugural showing in Madrid on June 6. Sponsored by grants from the American Express Foundation, the National Endowment for the Humanities and the National Endowment for the Arts, the show is now at the National Gallery of Art in Washington, D.C. (July 2-September 6), and will go next to the Toledo (Ohio) Museum of Art, where the idea for the exhibition originated as a cooperative venture based on the nominal sisterhood of two remarkably dissimilar cities (September 26-November 21), and will conclude its tour at the Dallas Museum of Fine Arts (December 12-February 6, 1983).

El Greco has been called a mystic, a hysteric, a lunatic, an incompetent, a genius, a "proto-Modernist" (upon some arguable premises), the ultimate Hellenist (upon hardly any) and, most absurdly, a victim of progressively defective eyesight—this last to explain his progressively drastic distortions of form and color,

Critic, author of Mainstreams in Modern Art *and* What is Art?, *among others, the author wrote on art of Bourbon Naples,* SMITHSONIAN, *December 1981.*

National Gallery of Art, Washington

An early work, before 1570, *Purification of the Temple*, shows influence of El Greco's Italian stay.

which are, on the contrary, deliberate inventions in as analytically developed a style as the history of painting offers before the 20th century. Alongside the violent dislocations of modern art, the distortions of this Old Master seem mild (actually they are more complex than they look), with the result that their expressive function now appeals to a lay public that found them only bizarre when realistic modes were in vogue.

Thus within the last 50 or 60 years, in the wake of a critical revival that began more than a hundred years ago, and the esthetic revolution of the early 1900s, this artist who worked within an elitist circle of intellectuals and esthetes, and who puzzled or repelled many of his contemporaries outside that circle, found a wide public audience for the first time. This development,

however, is not one that would have pleased him. ". . . If once in a while popular taste is right," he once wrote, "it is usually by accident and is not worth taking into account."

By 1577, when he was 36, El Greco had abandoned Venice for Rome and Rome for Spain, or, more accurately as it turned out, for Toledo, the somber aristocrat of Spanish cities on its granite hill, the seat of the Grand Inquisitors, and the spiritual capital of Spanish Catholicism. El Greco's Toledo was not yet the scene of desolation that some historians describe, but its population was draining away and its economy, along with its political prestige, was decaying. The city council attempted to counter the decline with a vigorous renovation program that sounds startlingly like the WPA programs in the United States during the Great Depression, but was less effective. Medieval buildings were torn down to be replaced by new ones in the latest style—in retrospect, not always a happy exchange. A new public granary, new plazas and marketplaces were created, as well as a brothel that became famous as the "House of Venus." These programs, however, were stopgaps; the end was in sight for Toledo as a thriving cosmopolitan city, with one magnificent exception: it retained its dominant position as the spiritual heart of Spain, with all the attendant splendors of the Church.

A beautiful hothouse atmosphere

To live in Toledo in its years of decline must have been to feel the essence of Spanish mysticism concentrated as if by distillation while the impurities of mundane distractions evaporated. In ecclesiastical circles there were no hardships. Toledo's prelates included some of the wealthiest men in all Spain. Fortunes from the personal coffers of archbishops and other high-ranking ecclesiastics were poured into the lavish decoration of churches and chapels. Toledo's expert craftsmen, famous since medieval times, flourished mightily in the generally depressed community. So did poets, literary men, intellectuals and scholars. The cathedral hierarchy and the university, which the cathedral controlled, included international reputations along with the expectable number of drones. Informal academies were organized in the homes of prelates, who participated as qualified intellectuals rather than as church officials. No matter that the atmosphere was somewhat that of a hothouse rather than an oasis; it was a beautiful hothouse providing ideal conditions for the cultivation of ideas that, in any case, were of little interest to people outside its confines.

In this atmosphere El Greco was transformed from a second-rate painter into a great one. It is difficult to believe that the same thing would have happened to him in Madrid or Seville; nothing like it was hinted at during his ten years in Venice and Rome. Not that this outlander, entering middle age, was suddenly touched by divine fire and transformed into a Spanish mystic. A major point in the reconsideration of El Greco's art inherent in the new exhibition is that esthetic calculation rather than spontaneous inspiration accounts for the development of his extremely personal style.

But why El Greco? And why so late in a hitherto unpromising record? Quite possibly it took a mature foreigner, an outsider like The Greek, to combine a personal response to the spirit of Toledo with the kind of analytical objectivity that made possible the materialization of that spirit in expressive images.

Whatever the catalyst, Domenikos Theotokopoulos

The Metropolitan Museum of Art

El Greco's formidable *Portrait of a Cardinal* was painted during the Inquisition and reflects the time.

of Crete became El Greco of Toledo. There he found his natural habitat; the artist and the city became inseparably identified with one another, and still are. His famous *View of Toledo* (p.54) in the Metropolitan Museum is not so much a view as a portrait, and like any good portrait it is less an enumeration of features than a revelation of the subject's inner life. The Alcántara bridge across the gorge of the Tagus, the belltower of the cathedral rising above low surrounding buildings, the great block of the alcázar—these and other structures clustered on the hill and down its slope to the river are identifiable in varying approximations of their topographical relationships as seen from a nonexistent vantage point, but all are transformed into a vision of a magical city in a setting at once stormy and celestial, all greens, blues and translucent silver.

As everyone knows who has seen it, the real Toledo is gray, cramped and forbidding—at least by contrast with the radiant city El Greco's portrait leads one to expect. In spite of its glorious cathedral and rich scattering of other fine buildings, only the most romantic souls among visitors today can attune themselves to an emotional recall of Toledo's great days except through the proxy of El Greco's paintings, which make the city virtually an El Greco museum and have immortalized it at the most intense moment of its mingled spiritual and intellectual life.

The decline of Toledo

El Greco died in 1614, and his city's further decline during the next decade partially explains why he was half-forgotten only a generation later. In addition, official doctrine in Spanish religious painting demanded formalistic treatment even in scenes of miracle, and El Greco's twisted, elongated figures, his supernatural lights, his intense colors, were unacceptable by the standards dictated in Seville and Madrid. In his old age, three years before his death, he was visited by Francisco Pacheco, the official censor of the Inquisition in Seville, a sound realist painter himself and a power in the politics of art, who was gathering material for a series of biographies of 16th- and 17-century Spanish artists. When his book, *Arte de la pintura*, came out in 1649, El Greco had been dead for 35 years, and although Pacheco wrote respectfully of "Dominico Greco" as a great philosopher, wit and scholar as well as the author of treatises on painting that have now disappeared, he introduced his comments with ". . . those who are acquainted with this man," which would suggest that El Greco's fame, then limited to his adopted country, must have faded away even there.

El Greco's isolation from the mainstream of Spanish painting and his adoption of Toledo as his permanent home were not entirely a matter of choice. During his first years in Toledo he found commissions that brought him to favorable attention throughout Spain. But he was a painter with a career to make and, like other artists of the time, he recognized that royal commissions were the sine qua nons of success. To this end it was imperative that he attract the attention of Philip II.

Philip was engaged in a prodigious undertaking, building and decorating the Escorial, his massive combination monastery, church, royal palace, mausoleum, college and library near Madrid, which meant a steady flow of commissions for altarpieces and other paintings. Word of this potential gold mine, reaching El Greco in Italy, was probably a reason for this ambitious but not very successful painter's otherwise unexplained emigration to Spain. He did receive what was probably a royal commission, *Allegory of the Holy*

League (*Adoration of the Holy Name of Jesus*), popularly known as the *Dream of Philip II*. According to some accounts he won the commission by presenting Philip with a small painting of the subject showing the Spanish King kneeling in the company of the Pope and the Doge of Venice, which so delighted Philip that he commissioned a larger painting that is still in the Escorial today.

But this preliminary triumph was followed by professional disaster when Philip awarded El Greco a commission to paint a *Martyrdom of St. Maurice*. The painting was accepted and paid for (it is still in the Escorial) but it did not please Philip, who refused to place it in the chapel for which it had been planned. El Greco had produced a great painting, but in the doing he had committed several tactical indiscretions at a critical moment in his career: the physical martyrdom was placed in the distant background; in the foreground Maurice stands quietly in contemplation of eternity, of bliss through sacrifice. Instead of the dramatic scene Philip had expected, El Greco had delivered a thoughtful reflection upon the personal religious values involved in martyrdom. Philip was probably repelled also by the total nudity of the victims of mass butchery in the background. Nudity except when absolutely required by established iconography—and then only with strategic concealments (which El Greco had omitted)—was unacceptable to the Inquisition's puritanical standards for paintings. In addition, and perhaps most offensive of all, the *Martyrdom of St. Maurice* includes passages of the kind of anatomical and perspectival distortions that were to mark El Greco's most personal style. These various issues affecting the reigning code of realism explain the painting's rejection. El Greco found himself effectively blackballed at the age of 41 and, in a way, exiled to Toledo. There he was able to find sympathetic patrons.

A reputation for arrogance

Even in Toledo there were difficulties. El Greco's fees were high, and disputes over payment were frequent. When he lost a suit for the payment he demanded for the painting now accepted as the consummate expression of his style, the *Burial of the Count of Orgaz* (pp. 57-58), El Greco is supposed to have said, "As surely as the rate of payment is inferior to the value of my sublime work, so will my name go down to posterity as one of the greatest geniuses of Spanish painting." Never one to underestimate his abilities, he maintained a reputation for arrogance that must have cost him some commissions that he would like to have had.

On one occasion in Rome, learning that Pope Pius V had ordered concealing draperies painted over the loins of the male nudes in Michelangelo's *Last Judgment* in the Sistine Chapel, El Greco is said to have informed the Vatican that a better solution would be to destroy the frescoes and let him paint another *Last Judgment* as masterful as Michelangelo's but with the improvement of "honesty and decency"—hardly an offer calculated to win favor in Italy where Michelangelo, dead for less than ten years, was regarded as a demigod and carried the sobriquet "Il Divino."

On the matter of the Sistine frescoes El Greco was exaggerating at best, for he had given little indication at that time that he was anything much better than a pasticheur drawing from half a dozen contemporary Italian sources. But as to the suit over the *Burial of the Count of Orgaz* and his prophecy of his own future place in Spanish art, he was right, of course. He could even have gone further and said "one of the *three* greatest geniuses of Spanish painting." El Greco, Velázquez and Goya are the great Spanish trio, with El Greco, the foreigner, the most vehemently Spanish

Museum of Fine Arts, Boston

In major portrait, El Greco looked kindly on friend, poet and scholar *Fray Hortensio Félix Paravicino.*

The Metropolitan Museum of Art

One of history's best known and most impressive paintings is the master's *View of Toledo,* about 1600.

of them all, representing as he does the elements of mystical passion that animated the complex structure of the Spanish soul.

The opportunity to sacrifice Michelangelo's Vatican fresco in exchange for a *Last Judgment* by El Greco in his most dramatically ecstatic style as exemplified in the National Gallery's *Laocoön* (pp. 48-49), or the Metropolitan Museum's *Vision of Saint John*, might be tempting today if such an excruciating choice could be anything but imaginary. But those masterpieces were far in the future when El Greco made his proposal. *Purification of the Temple* (pp. 50-51) in the National Gallery (one of several versions), representing El Greco at his then best, is evidence enough that nobody except the artist himself found the idea anything but laughable at the time—nor could anybody today. And yet here is a fascinating picture when it is seen as a rare document in the history of a great painter, partly because of its shortcomings as a work of art in itself.

Italian bits and pieces

Certifiable paintings from El Greco's Italian period are rare in any case, and *Purification of the Temple* was surely a most ambitious one. Titian, Tintoretto, Veronese and Jacopo Bassano, among others, have involuntarily contributed to the pastiche. There are attractive passages, such as the escape into the distance at the right (borrowed from Tintoretto), and individual figures in the melee that, by hindsight, hint at what El Greco was to become (they, too, related to Tintoretto), but all the bits and pieces borrowed from here and there remain bits and pieces, unfused into either a well-structured pictorial composition or a consistent mood. The female figure of a bird seller at the lower left, as a radical instance (a hybrid bred from Titian and Veronese), would fit better into a calm Olympian scene as a goddess rather than as one of the mercantile sinners being driven from the temple.

It is typical in El Greco's development that wherever he failed to assimilate the studio methods (drawing, composition, paint handling) of the Italian artists he set out to emulate early in his career, he more than compensated by creating methods of his own in his mature style. If the composition of the early *Purification of the Temple* is a faulty imitation of contemporary models, that of the *Burial of the Count of Orgaz*, painted when El Greco's powers were at their height, is brilliantly original without being eccentric. Other painters again and again had combined earthly and heavenly units in a single picture, but none before El Greco had had the daring to separate them spiritually by dividing a single picture into two contrasting styles —while maintaining the picture's unity. Supernatural bursts of light and weightlessness that allowed heavenly figures to levitate or sit upon clouds were considered sufficient differentiation between the two worlds. Otherwise, both halves were painted with the same degree of realism.

Installed in its chapel in the church of Santo Tomé in Toledo, the *Burial* is designed to open an illusory windowlike space above the Count's sarcophagus. In the foreground of this vista the body is being lowered into place by St. Stephen and St. Augustine, who by legend appeared miraculously to assist at an event of 1323 that El Greco represented as contemporary. Attendants at the burial are ranged in the foreground as if on a ledge not quite visible to the observer; their slender hands and elegantly attenuated features are witness to their aristocratic lineage, but they are earthlings nevertheless, painted as earthlings in El Greco's more realistic style. Above them a heavenly vision unfolds in his most personal style, with forms swelling, contracting, dissolving and coalescing in combinations as dynamic as the earthly section is serene, as rapturous as the other is subdued. The Count's soul, a glaucous infant who seems made of the same material as the clouds on either side, is lifted toward Christ's throne by an angel, while the Virgin and St. John the Baptist intercede for the new arrival. Ranks of other saints and heavenly creatures are in attendance at the presentation.

A subtly organized pictorial fugue

The two parts of the picture are unified by a simple geometrical scheme in which the celestial portion is constructed on a pyramid that rises from the horizontal band formed by the participants at graveside. To enumerate the elements that are adjusted to echo, reverse and vary the basic scheme would be to enumerate each detail in this pictorial fugue; a major one is the secondary pyramid formed by the three areas of yellow—the robes of the saints lowering the body into the grave, and that of the angel above them. Yet this is not a picture like many of its predecessors in Italy where at least half the pleasure for the observer comes from analyzing the structure. On the contrary, the *Burial* is so subtly organized that the placement of its infinitely various elements seems to have been spontaneous rather than calculated.

The *Burial of the Count of Orgaz* is the kind of picture that, painted in Italy by an Italian, would have become a seminal influence on young artists and the subject of gossip and records that would tell us whether or not the young boy at the far left is really Jorge, El Greco's illegitimate son, and just which of the painter's friends were recruited to serve as models for the mourners. These are obviously portraits modi-

fied to share an aristocratic family resemblance and deindividualized as personalities. To have shown each one reacting in his own way at the climactic moment of the burial would have been to distract attention from the central events—the lowering of the Count's body and the flight of the soul—and destroy a mood that, for all its poignance, is held within the bounds of patrician reserve.

Under other circumstances El Greco was unexcelled as a portraitist in his perception of individual personality and his ability to reveal that personality through a sufficiently realistic record of surface appearance. His portrait of the powerful Inquisitor General Cardinal Don Fernando Niño de Guevara (p. 52) in full regalia is such a telling comment on the self-assured, unyielding conviction of unchallengeable authority in the mind behind an unexceptional set of features, that the dazzling cascade of crimson robes, the elaborately tooled leather wall covering in the background, and the patterned marble floor offer no competition to the small area occupied by that shrewd and worldly face. (Eminent El Greco scholars, who have been working for years on the present exhibition, are now of the opinion that this famous portrait is actually that of Cardinal Bernardo de Sandoval y Rojas, himself a later Grand Inquisitor.) In total contrast, the portrait of the theologian, scholar and poet Fray Hortensio Félix Paravicino (p. 53) is at once an affectionate personal tribute to the sensitive intelligence of a young friend and as fine a personification of humanistic ideals as the history of painting offers.

Records of El Greco's personal life are rare from birth to death, and any concerning his professional life before his arrival in Spain are sketchy at best. By evidence that he was well educated as a young man, he must have come from a good family, and we know from Pacheco that he became a respectable scholar and philosopher. (It is more surprising that Pacheco also calls him a wit.) His treatises on the theory, practice and history of art are apparently lost forever, but marginal notations in his own hand recently discovered in books from his library confirm his intellectualized approach to his own art, an approach recognized some time ago by El Greco scholars on the basis of evidence inherent in his paintings as against the opposing idea of romantic propulsion.

As for the proto-Modern tag, El Greco can be called an Expressionist only in the very broadest sense of the word by which any art is Expressionist in which the emotional impact on the observer is created by strong exaggerations and distortions. He was not at all a prophet of modern Expressionism, in which the exaggerations and distortions are dictated by emotional forces within the artists themselves and find release in the creative act. The fact that legend had made him a mystic, a recluse, even a lunatic, is tribute to the effectiveness of his style, but to identify the personality of an artist with the images he paints is hardly safer than to identify an actor with a great role. Some degree of empathy between role and actor, or between subject and painter, may be prerequisite, but a great performance does not gush forth by itself like blood from an opened vein. Excess poundage alone cannot make a great Falstaff, nor is an old, sick, mad, outcast actor likely to make a great Lear.

Classify him great

The very definition of mystical experience as the intuitive comprehension of truths beyond human understanding precludes the mystic's translation of such experience into comprehensible images. A rational go-between is necessary. The power of El Greco's art is that he makes a mystical world comprehensible.

By art-historical classification, El Greco is a late Mannerist, Mannerism being a term denoting the search for high style, often eccentric and theatrical and centered in Italy, that filled the gap between the moment of balance called the High Renaissance and the Baroque. The only Italian artist El Greco is known to have been allied with was a Mannerist, Giulio Clovio, admirable as one of the most elegant of the breed but by corollary also one of the shallowest. There are Mannerist reflections of the Michelangelesque type in the foreground figures of the *Martyrdom of St. Maurice*, but "Mannerist" when applied to El Greco's fully mature work is little more than a pigeonhole where we can file the name of an individualist who surpassed Mannerist limitations. The only classification in which he can be placed without question is one where he knew he belonged: he was a great painter.

A masterpiece in memory of the Count of Orgaz

Memories of good works are long in Spain. In 1586 the parish church of Santo Tomé, in Toledo, ordered a painting to memorialize Gonzalo de Ruiz, Lord of Orgaz, known for his good works, and dead for 263 years.

El Greco signed the contract for a wall-size painting, *Burial of the Count of Orgaz*, 16 feet high by 12 feet wide, in 1586 and completed it in two years. It is today widely regarded as his masterpiece.

In it, as the parish priest prays, Saints Stephen (left) and Augustine, descended from heaven, help to lower the Count's body into the grave. Above, the Count's soul, in the form of a gossamer infant, is presented to Christ.

Fold out ⟶

Santo Tomé, Toledo, Spain

A contentious commission for a chapel to St. Joseph

The Greek, by now a citizen of Toledo and its leading painter, signed an agreement in 1597 to paint three altarpieces for a private chapel dedicated to St. Joseph. He was 56 years old and in full command of his art.

The main altarpiece for the chapel, the first to be dedicated to St. Joseph in the entire history of Christianity, was to consist of two paintings, *Saint Joseph and the Christ Child* and a *Coronation of the Virgin*. The lateral paintings were unspecified but came to be of *Saint Martin and the Beggar*, one of his major works, and the *Madonna and Child with Saint Martina and Saint Agnes*, reproduced above, a radiantly tender painting. The authority Alfonso E. Pérez Sánchez, professor of art at the Autonomous University of Madrid, has said that it is "beyond doubt one of the painter's noblest and most harmonious works."

Noble and harmonious though it is, it was the cause, once again, of a battle over payment. Great artist that he was, El Greco was one of the most litigious of men. Though he made a good living at his work he was a poor manager of his finances and was prepared, as he often did, to do battle over the final amount of payment for it.

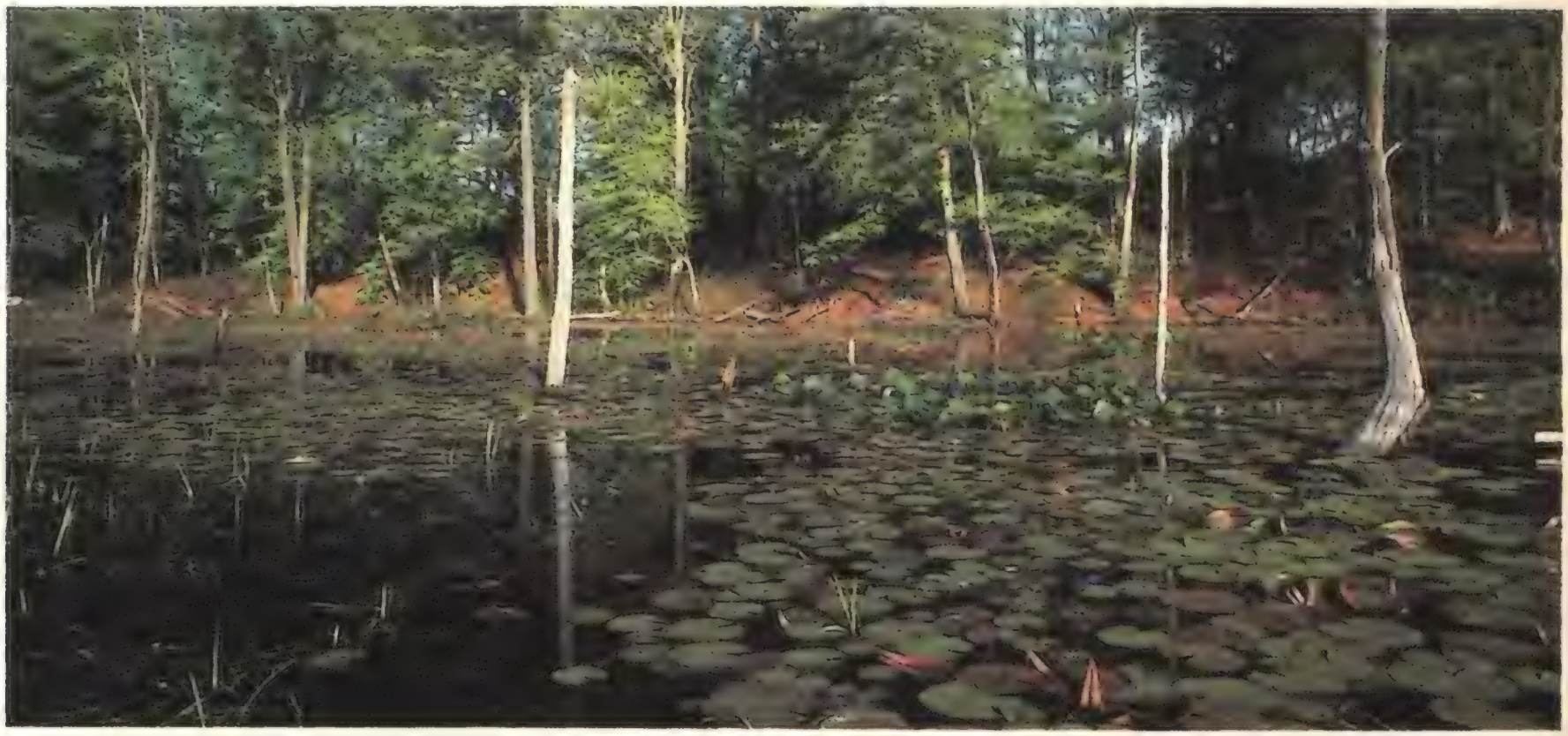
Under the system at the time both the contractor for a work of art and its executor would name assessors who independently set a value for it. In the event of a serious disagreement, an arbitrator would make a final judgment. In this case El Greco won the fight and was paid 2,850 ducats for his work, a good deal of which, as was also customary for him, was already owed to his creditors.

National Gallery of Art, Washington

Photographs by Robert Noonan

Secrets of still waters

Although it may seem placid on the surface,
a freshwater pond seethes with small creatures
that compete fiercely for food and survival



Deceptively tranquil in appearance, a roadside pond in Harford County, Maryland, teems with activity.

With a practiced and serpentine motion of his wrist, Robert Noonan scoops a kitchen strainer through the aquatic vegetation and lifts it up, dripping with fronds of carnivorous *Utricularia.* He empties the strainer into a Tupperware tray. Against the white background, things begin to move among the *Utricularia* plants: darting copepods; fire-red, pinhead-size aquatic mites; a diving beetle that caroms about like a demented Pac-Man; a delicate damselfly larva with feathery tracheal gills at the end of its abdomen; a squat, pugnacious-looking dragonfly nymph; an inch-long predacious water bug—a male whose back is encrusted with eggs his mate has cemented there, leaving him a perambulating nursery.

In the pond, insect predators often kill vertebrate animals. Here a one-inch water bug attacks a tadpole.

Behind us, a few yards away, 18-wheelers thunder past on a four-lane highway. At our feet lies a submerged automobile tire. Beer cans and plastic six-pack holders are strewn among the lily pads. Noonan pokes at his tray. He says: "You couldn't ever dream up creations like these."

Noonan has been photographing this little pond north of Baltimore, and a couple of others nearby—one of them backed up against the fill dirt of a Burger King

parking lot—for more than a year. He makes most of his pictures at the pond; sometimes he takes home small creatures to photograph them in an aquarium, and when their portraits have been made he returns them to the pond alive. "You have an obligation to them," he says.

The day with Noonan is an exercise in nostalgia. My pond was in northern Ohio, a half mile through the woods from the house where I grew up. To an adolescent daffily preoccupied with natural history, the pond was jungle and veldt, tundra, mountain and sea. I read stories about Paul Siple, the Eagle Scout who went to the Antarctic with Byrd, and about the young Craighead brothers who flew falcons with Indian princes, and I was painfully aware that they had set off on their adventures when they were not that much older than I was. At 13, in Euclid, Ohio, and with no such prospects, the pond was the best I could do. I marched there in hip boots, armed with a net made of a broom handle and an old cotton curtain; a peck basket full of Mason jars for live specimens; a killing bottle charged with Carbona cleaning fluid; a pair of long-nosed forceps my aunt, a nurse, had liberated from the Cleveland clinic; a collecting bag (for which read old pillow slip) in case I encountered a good snake; and a copy of Ann Haven Morgan's *Field Book of Ponds and Streams.* I slogged back to the house and my perplexed parents after dark —muddy, happy, tired and smelling of pond.

What took me there is what brings Noonan here. The richness and density of life, the accelerated pace of procreation and death, the compression of nature into a close-at-hand microcosm, the ingenious and infinite variety of adaptation. The dragonfly nymph, a sedentary, gill-breathing, aquatic lump, captures hundreds of mosquito larvae each day with thrusts of a lower lip that fires like a missile; on an afternoon in late spring it transforms into a glistening aerialist that uses huge multifaceted eyes to home in on adult mosquitoes, and scoops them up in a lethal basket formed by its legs. There are creatures here that breathe through gills on their limbs, that breathe through snorkel tubes attached to their abdomens; others, like scuba divers, carry their own air supplies beneath the surface. There are creatures with oar-shaped legs that propel them like single sculls beneath the surface; others with legs like delicate stilts on which they skate along supported only by the water's surface tension.

Consider scale. After an hour of prowling the borders of the pond and peering into Noonan's strainer at tiny insects and crustaceans, I see, hovering near an area of bottom that has been swept clean of debris, a fish—a bluegill patrolling its nest site. "Look at the big fish," I say, and realize as I say it that the bluegill is in fact only six inches long. It seems large only to my scaled-down consciousness of the moment. How awesome the bluegill must appear to the damselfly nymph. Were we on the scale of the creatures of the pond, we would be hopelessly vulnerable to their speed and strength and armor and weapons.

A small freshwater pond is sleepy-looking, in repose, but beneath the tranquil surface it is an almost unimaginably violent place, the lair of biting, rending, piercing, sucking, stinging little gangsters who spend their days and nights wreaking havoc on their neighbors. But violence fascinates, whether it be in the tragedies of Elizabethan dramatists or in the pond's voracious competition. As a boy I would sit before my aquaria transfixed by scenes of thuggery as the creatures of my day's catch went about murdering one another. My parents found my preoccupation with this mayhem disturbing, as well they might were it the only thing that drew me to the pond, but it was not.

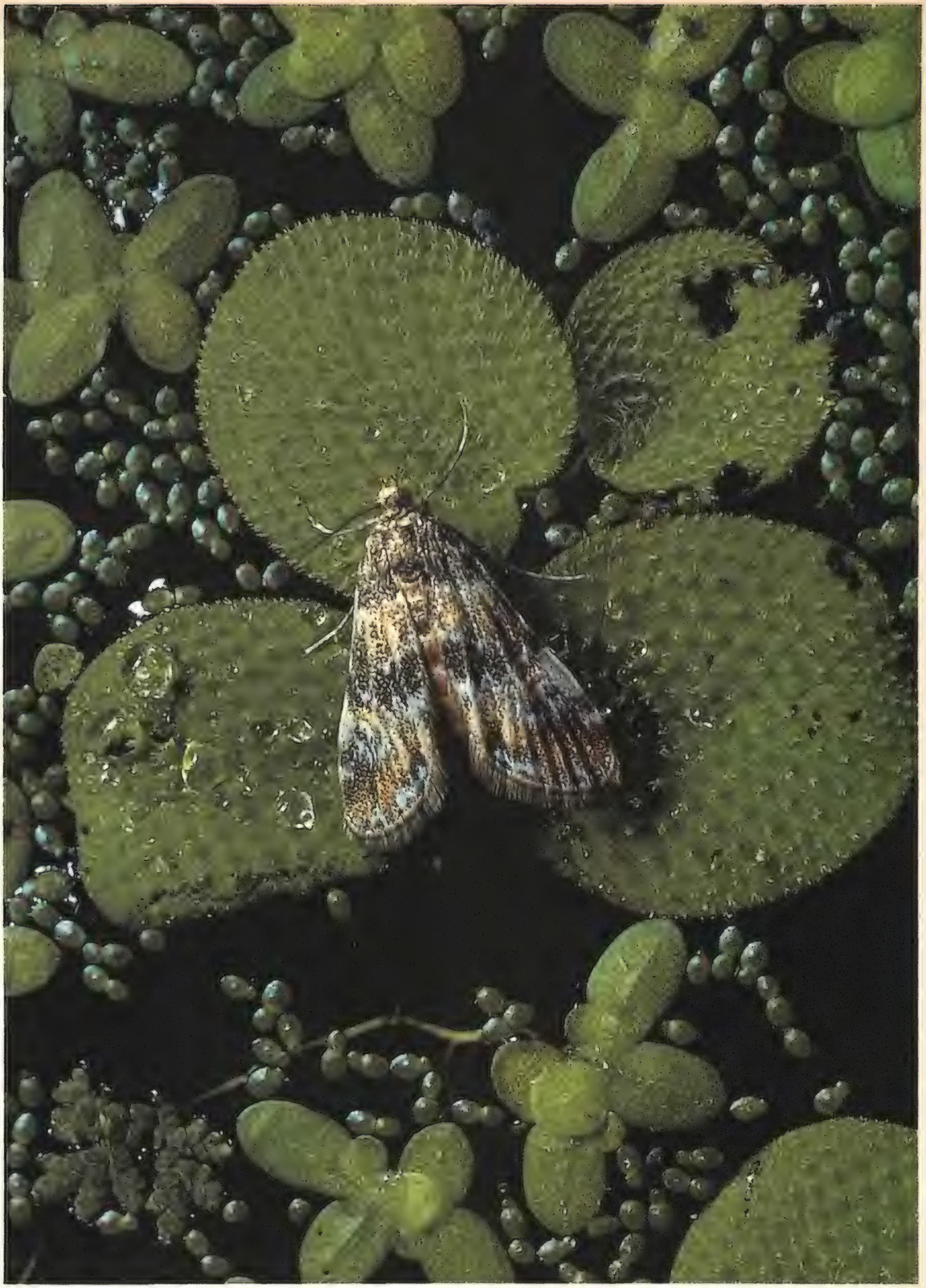
There were also: the flash of a redwing's epaulets among young cattails; the golden burst of a prothonotary warbler among the branches of an overarching beech; the sartorial elegance of a ribbon snake; the stately curiosity of a dragonfly as it looked me over, eyeball to eyeball; the chorus of tiny frogs whose throats ballooned with springtime ardor until the throats seemed larger than the frogs themselves; the intricate patterns traced on smooth black water by fast flotillas of whirligigs; the evanescent beauty of a fairy shrimp, the clockwork of its body revealed through an abdomen transparent as glass. No trips with Byrd or falconry with princes—but I could have done worse.

Well, the little ponds along the Northeast corridor are going fast, Noonan tells me, eaten by landfill, disappearing beneath the highways and subdivisions and shopping centers. My own pond in Ohio went down that road long ago. Rivers and lakes and mountains and forests have their bands of organized, purposeful defenders, with lobbyists in Washington and professional fund-raising campaigns. But who mourns the loss of a stagnant one-acre pond with beer cans blooming among the water lilies? Noonan does, anyway.

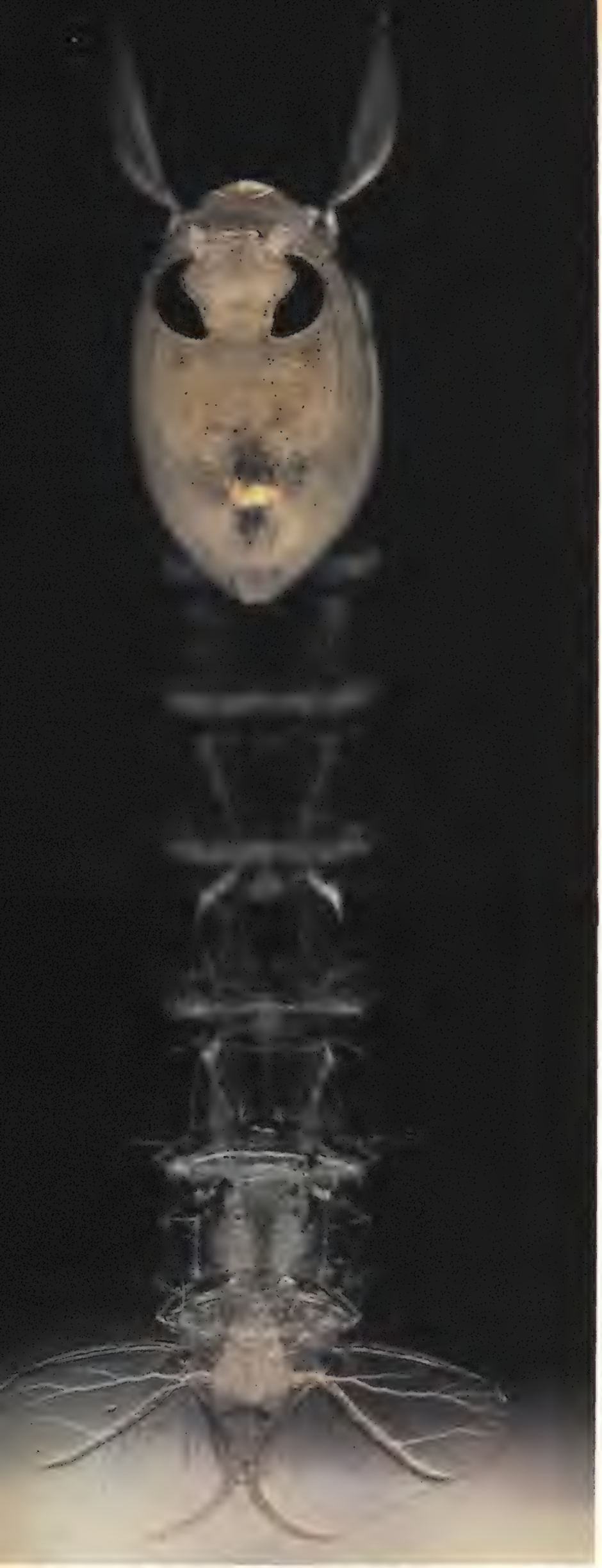
He lifts his strainer again, pokes at it. "Long-jawed spider," he says. Pale, fragile-looking, perhaps half an inch long, it is not really aquatic but a builder of exquisite webs at the water's edge. Gently, Noonan lifts the spider on a piece of flotsam, transfers it to a plant stem above the water. The spider elongates itself, legs aligned with its body so that it becomes almost invisible, a slender mote of detritus.

Noonan observes the spider for a moment. "You could spend your entire life here," he says. "And still know nothing of what there is to know."

Don Moser

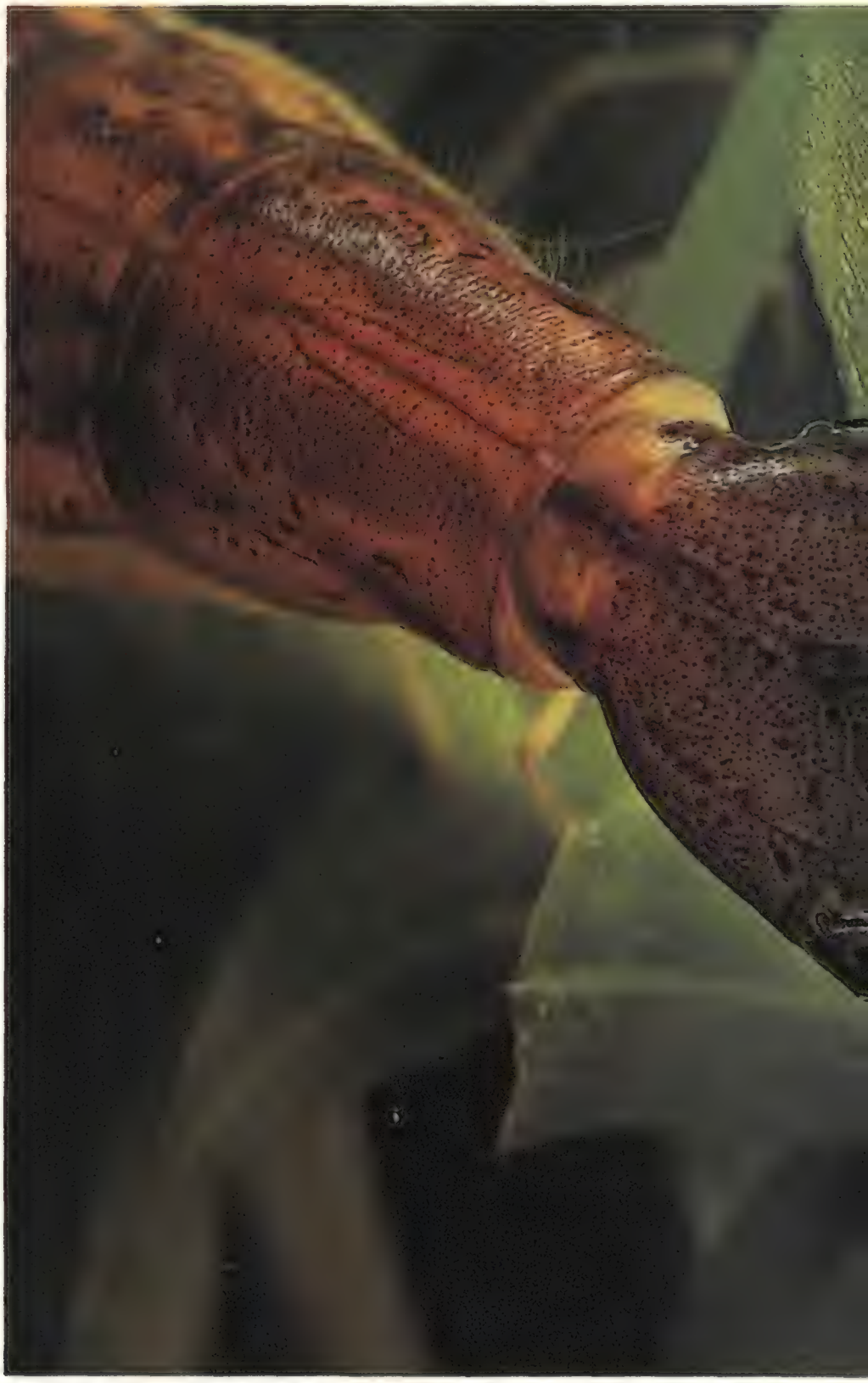


A moth, adult form of an aquatic caterpillar, rests on *Salvinia,* a plant native mostly to the tropics and subtropics. Plant may have been introduced through aquarium dumping or on the feet of waterfowl.



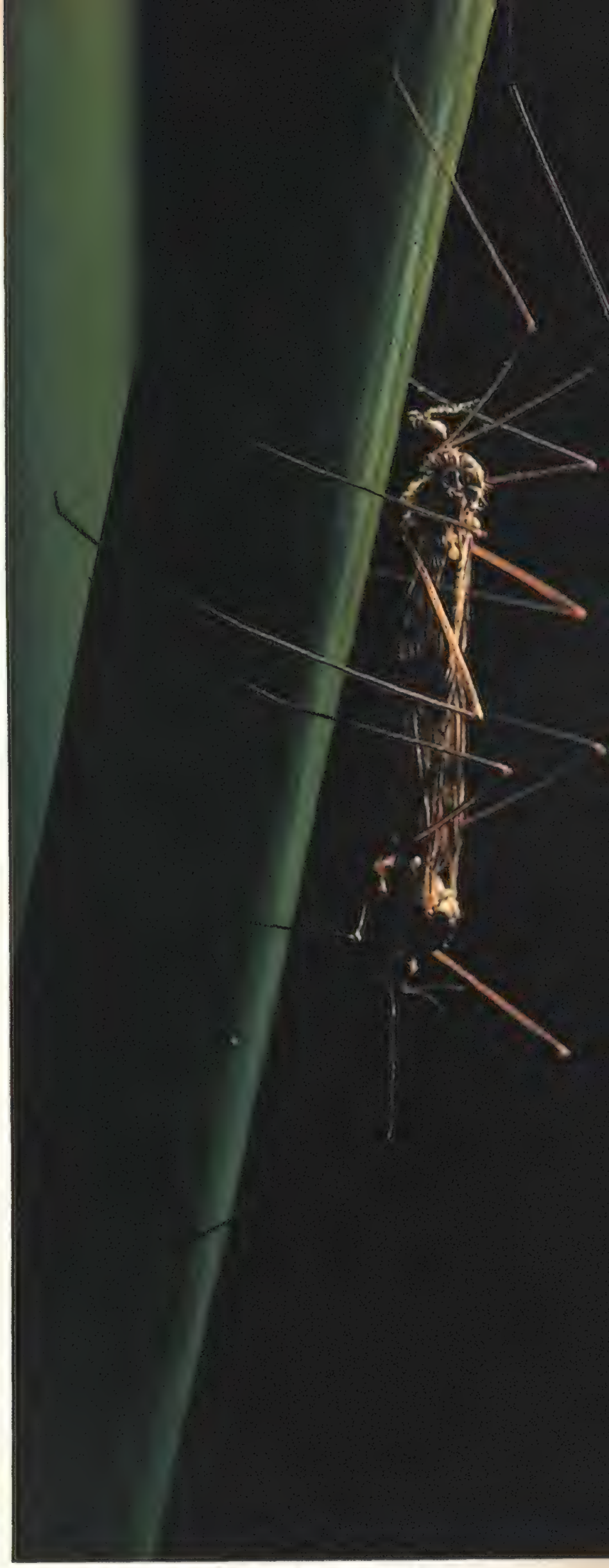
Enlarged 28 times, ghostly pupa of phantom midge is intermediate form between the larva and the adult.

The voracious nymph of a dragonfly lies in ambush as an unsuspecting mosquito larva wriggles nearer . . .



Fierce water tiger, larval stage of a diving beetle, sucks bodily juices of its prey through curved jaws.

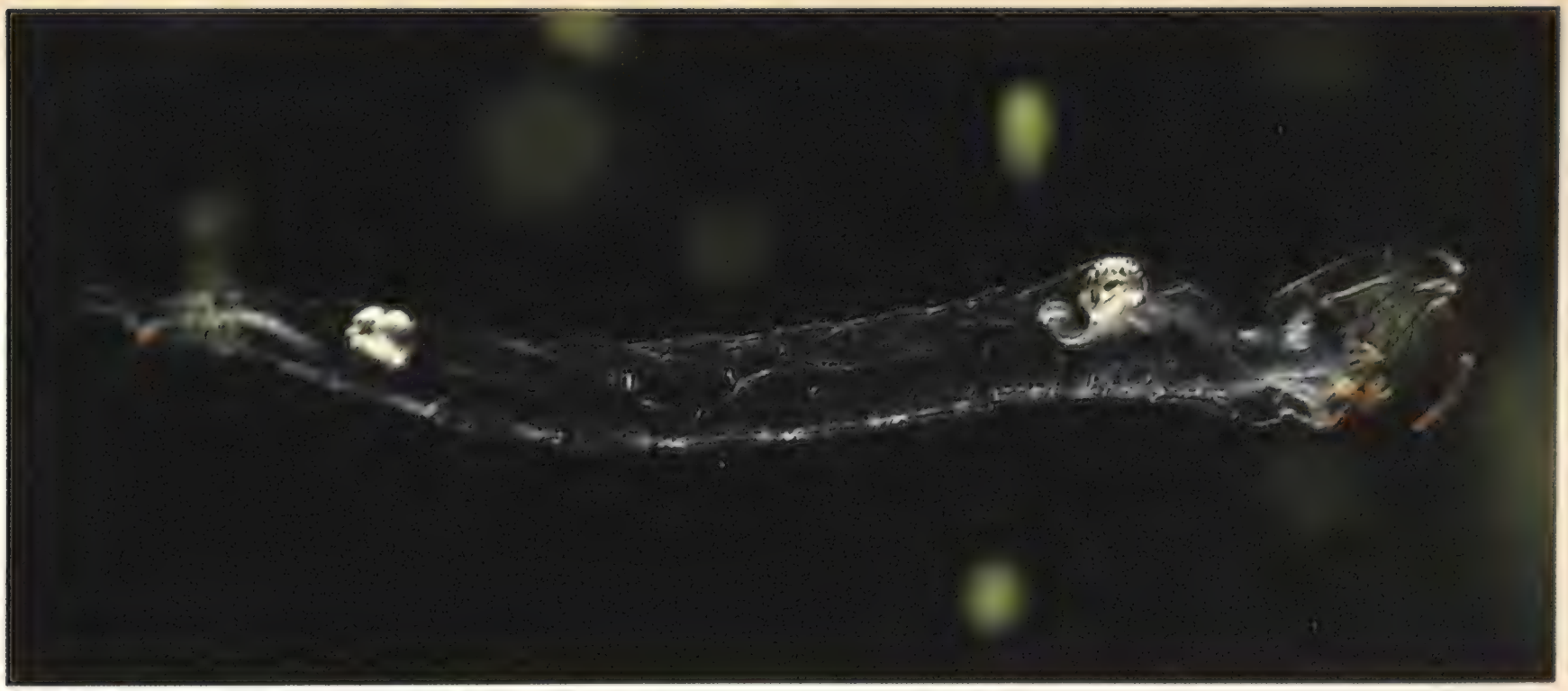
. . . and when the larva comes within range the dragonfly snares it with a quick thrust of its lip.



In a rite of spring at the pond, two crane flies, joined abdomen to abdomen, mate on cattail stem.

A hydra, a tiny freshwater polyp, feeds on an insect larva it has subdued with stinging tentacles.

Dwelling upside down in a submarine world, the backswimmer uses oarlike legs for rapid propulsion.



Though it appears the essence of fragility, larva
of a phantom midge is nevertheless a fierce predator.

An emerging adult midge struggles in the surface
film as it forsakes aquatic existence for an aerial one.

After creeping from the water and casting
off its nymphal husk (right), dragonfly dries
its four brand-new wings in the sunshine

By Dora Jane Hamblin

Bearing witness to City of David's life and death

Ancient Jerusalem's sophisticated urban plan emerges as archaeologist Yigal Shiloh, staff and volunteers begin fifth season on sheer scarp

Building "a new Jerusalem" has been a wistful dream for generations of Utopians and city planners. Digging up the old one has proved almost as elusive, as dozens of professionals and hundreds of volunteers can attest after four arduous seasons on the crumbly, slippery, canted slope of the ancient city just below the Temple Mount. "Here the archaeologist's problem is two-fold: where to dig and how not to fall off the hill," quipped excavation head Yigal Shiloh to a group of prospective volunteers.

No other place name in the world carries such a load of passion, such a freight of conflicting claims and dreams, for contention lies at the heart and soul of the city. Sacred to three great religions—Jewish, Christian, Moslem—it has been fought over for three millennia by everyone from Babylonians to Byzantines, from Alexander the Great to Suleiman the Magnificent, from Christian Crusaders to Jewish heroes, English Tommies and modern-day Israelis. On April 19, 1911, a city-wide riot occurred in which the government citadel was stormed, the Turkish governor threatened, his troops utterly unable to put down the disturbance. That time it was Moslems rioting against the activities of a British team determined to locate the treasures of King David and King Solomon. Already the local Jews were outraged at this possible defamation of holy places, but when the British team leader, Capt. Montague Parker, and his men disguised themselves as Arabs and started hacking around, the local Moslems went wild. Dire rumors flew that the infidels had stolen the Crown and Ring of Solomon, the Ark of the Covenant, and the Sword of Mohammed. The truth was that Captain Parker and company had never laid eyes on any of these things, let alone stolen them, but the city was in turmoil for days. Parker fled to Jaffa and from there was said to have escaped to England on a private yacht, pursued by the Turkish authorities.

No such derring-do was required of Shiloh and his young diggers, many of them college students from the United States. But they were not looking for treasure.

What they did find was a lot of other people's leavings—tons of destruction from 586 B.C. when Nebuchadnezzar and his Babylonians conquered the city and razed it; from A.D. 70 when the Romans put down the great Jewish revolt; dumps from about a century and a half of other archaeologists' digs; the residue of later habitation higher on the hill, of the wars of 1948 and 1967, and of postwar building; plus the detritus of erosion. The debris was 30 feet deep in many places, but burrowing patiently since 1978, sifting through tons of soil, carrying it away in rubber buckets and lurching wheelbarrows, they have at last reached the levels they sought: the tumbled remains of the city that David captured in the first millennium before Christ and that his son Solomon enriched.

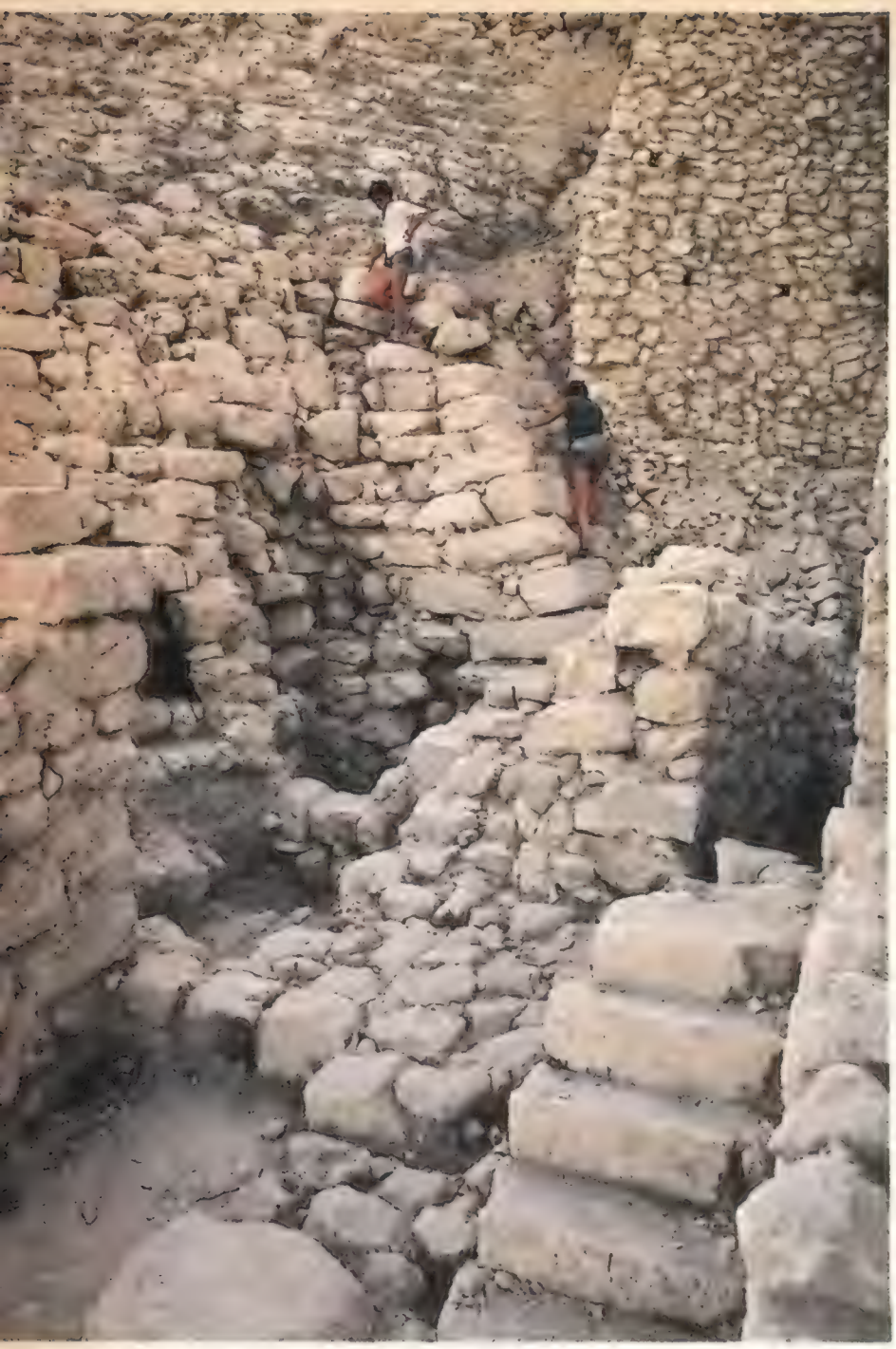
A most monumental construction

No trace of the storied First Temple of Solomon has appeared, nor anything like a royal palace, though a massive, tall, stepped-stone structure, which may be part of the substructure of the citadel of Jerusalem—possibly built by David or Solomon—is coming to light at the north end of the crest of the hill, nearest to the Temple Mount itself. This would place it, logically, in the most important location of First Temple times, and Shiloh has called it the most monumental Israelite construction yet uncovered anywhere in Israel. It is dated from potsherds and ceramic evidence to the time of David and Solomon, and it lies well inside the Israelite city wall. It is adjoined by another large, later eighth- or seventh-century B.C. building, where several courses of carefully worked ashlar or dressed stone were being uncovered when the past season ended.

Near the massive building, and partially built into its steps, archaeologists found a well-preserved four-room house typical of the First Temple period, with three oblong rooms in a row and a fourth, about 18 by 9 feet, running at right angles along the back. The

Volunteers clear second-century B.C. terraces; remains of First Temple-era tower (1000-586 B.C.) are below.

Photographs by David Rubinger



Excavation supervisors climb massive structure from David and Solomon's time. Its use is unknown.

Ultra-Orthodox Jews, fearful lest dig disturb old cemetery, tried to halt it, were routed by police.

inner room had a round hearth in the middle, the back room a stone hearth sunk into the floor. Adjoining this lay a three-room house within a niche, a shaped-stone toilet seat and a washbasin set into the plastered floor. All—houses, massive buildings, ashlar structure—had been destroyed in the Babylonian assault of 586, but their ruins were preserved under a much later stone-and-beaten-earth glacis, or slope, which was built in Hellenistic or Hasmonean times, roughly between 332 and 37 B.C.

The picture which comes to life is of a surprisingly small city occupying only about 45 dunams, or 12 acres, along the crest and down the side of a steep limestone hill extending south from the Temple Mount. It must have been a very Oriental-looking city with perhaps 6,000 souls crammed together in a warren of narrow lanes. The steep slope posed problems for the builders, but they solved it with terracing, cleverly using the terrace walls as back walls of dwellings. An intricate and well-planned drainage system was built into the terraces, with covered drains conducting water and refuse down to and through the city wall.

There was plaster on the floors of the houses, which probably were flat-roofed and of more than one story, with stepped passageways or ladders leading to roofs and upper levels. In the City of David there was no such thing as privacy: life was lived in full sight and hearing of the neighbors, on the flat roofs or in the crammed-together houses.

The residents of those days drew their water supply from the Gihon spring, as did the Jebusites before them and as some still do today. Certain domestic animals—a donkey, for example—might be tethered inside one of the rooms of a four-room house, but the flocks were grazed outside the wall on adjoining hillsides, and an elaborate water channel diverted the

The author has written extensively on archaeology of the Mediterranean, most recently in SMITHSONIAN *on the reappearance of Carthage (February 1979).*

This passageway, skillfully chiseled into bedrock, may have been an Israelite street or drainage channel.

spring water to fertile small fields in the narrow Kidron Valley and to spreading low acres at its mouth, where the Israelites raised grapes, olives, barley, a kind of wheat, millet, melons, sesame and chickpeas.

Some of this food must have been stored in a public or royal granary. In 1978, near the crest of the hill at about its midpoint, diggers found among the destruction debris a small red stone plaque about four-by-five inches with three clear chiseled lines of paleo-Hebrew writing, which seem to refer to numbers and to a "heaping up" or "accumulating." Where it came from they could not then guess, but later excavation has exposed, on the topmost of four terraces, the lower courses of a massive building. Remains of storage jars here, and the size of the building itself, hint that it may have been a storehouse in the time of Judean King Hezekiah at the end of the eighth century B.C.

The more they dig, the further back in time the archaeologists go. In both 1980 and 1981, patiently clearing debris from the base of the city wall, which is now exposed for more than 120 feet, diggers came across holes leached into the limestone hillside. They were full of broken pottery, metal objects, stone and bone artifacts which had fallen in and been preserved while millennia of destruction swept over the cliff. They indicate human habitation going back more than 5,000 years to some unidentified, possibly nomadic, people who settled here on the bedrock, drawn by the waters of the Gihon spring, the easily defendable limestone scarp, the fertile valley. From sometime in the Chalcolithic age and into the Early Bronze, roughly 3200 B.C., there were people here, but no artifacts datable to this period had been found here previously.

By 1000 B.C. Jerusalem was a small walled city in the hills. About that time David took it from the resident Jebusites, bought the famous "threshing floor" as the site of the Temple to be built by his son Solomon, and thrust the city onstage as capital of the United Kingdom of Israel and its military, political and social

Ambassador College volunteers emerge from slog in Hezekiah's tunnel, ancient Jerusalem water system.

center. And from that day to this its troubles have never ended.

After the Six Day War in 1967, in which Israelis for the first time in their nationhood controlled all of the divided city, the hill of the City of David was untouched while massive excavation was carried out in the Jewish Quarter of the old city and along the southern section of the Temple Mount just outside the 16th-century Turkish walls.

There were practical reasons for this neglect. One, Jerusalem is a living city with modern inhabitants who cannot be uprooted (there is no excavation on the heavily built crest of the hill). Two, more than a century of off-and-on digging had failed to turn up any significant remains of First and Second Temple periods. Third, there was a severe lack of funds and available experts to do the work.

But a few diehards were obsessed by the idea of again digging the hillside. Among them was a group of South African archaeology buffs with funds at their disposal, headed by businessman Mendel Kaplan. Others were the indefatigable mayor of Jerusalem, Teddy Kollek; Yigal Shiloh, professor of archaeology at the Hebrew University of Jerusalem; and several college groups and foundations from the United States.

These rather unlikely allies gradually came together and were aided by a series of unrelated events in Jerusalem itself: one was a construction project for drains in the Kidron Valley, another was the collapse of earlier archaeological dumps which resulted in landslides and the deaths of six children playing on or near them. The municipality of Jerusalem had to take action, and the archaeologists rushed to help. Out of it all came "The City of David Society for Excavation, Preservation and Restoration of the City of David, Jerusalem." The president of this jaw-breaking society is the mayor; its members include the Jerusalem Foundation, the Israel Exploration Society, the Institute of Archaeology of the Hebrew University of Jerusalem, the South African sponsors, and other colleges and organizations.

Pre-excavation planning took a full year before the first spade hit the earth in 1978. Yigal Shiloh was appointed dig director and he assembled a small staff of young professionals, several of them his own graduate students at Hebrew University. For the donkey work he announced that he would depend on volunteers, and he found them: one nucleus comes every year from South Africa, another from Ambassador College in Pasadena, California. Each official report from the dig concludes with an invitation to come and help, and each year more volunteers rush to the call. More than 400 work during the July-August dig-

ging seasons, about 120 at a time under careful area supervision by the professionals. Among the 110 or 120 sweating, dirt-encrusted volunteers clinging to the hillside on any given day last summer were a retired FBI man from Washington, a Filipino student sporting an Arab headdress, a Pan Am ticket seller on vacation from her Manhattan job, a wandering student from an Italian university, a doctor's daughter from England who likes gluing pots together, a housewife from Cleveland who has family in Israel, and a couple of Jewish girls from New York who wanted to see the country.

All pay their own way to Jerusalem and find lodging anywhere from medium-price hotels to grimy pads or dormitory beds in a nearby kibbutz. They pay for their own meals and are expected to get themselves to the site by 6:30 A.M., toil in boiling heat until 12:30 with a half-hour break at 10 A.M. for restorative cold drinks and fresh fruit supplied by the organizers. Some get university credit for their labor, others get only sunburns and sore muscles and the heady joy of hard work well done. Most sign up for two weeks or a month and either ask to stay longer or come back another year.

Push-ups at headquarters

"We really prefer young people because it is very demanding, physical labor," says Jane Cahill of Houston, a graduate student at Hebrew University who was last year's volunteer supervisor, "but we don't turn away anyone who really thinks he or she can do it. We had one man well up in his 50s whom we kept trying to discourage by mail, until he finally got so exasperated he turned up at headquarters and started doing push-ups on the floor to show us how fit he was."

In return for their labor, volunteers are given tours of nearby sites, scheduled lectures on the archaeology of their own and related areas, visits to the city's museums, scary trips through the 533-meter-long rock cut which is Hezekiah's tunnel, casual social evenings at Shiloh's home.

"The volunteers give us a very, very great deal," he says. "We want to give something back." In addition to an intensive short course, he also gave them "graduation certificates," little testaments to their work written in Hebrew and thrust through the fragmented handles of Roman pots.

When they are asked "What's new?" the diggers of the City of David are fond of replying: "Nothing. It's all in the Bible. . . ."

Well, it isn't *all*—but there's a lot. They have found remnants of the Iron Age wall the Jebusites built. They have found the destruction levels of Babylonian King Nebuchadnezzar's assault. They have even

Jane Cahill of Houston carts debris from productive area G, where four-room Israelite house was found.

Thanking volunteers, Shiloh presents them with certificates in Hebrew, tucked in Roman pot handles.

City of David comes to light

Tiny terra-cotta laughing horse was recovered in first season; it is late Israelite, 2⅜ inches tall.

found, for the first time in clear stratigraphic levels, evidence of the Biblical Return of the Israelite Exiles from Babylonia to Jerusalem in 538 B.C.

The diggers have found clear evidence of the reinforcement of city walls and public building in the time of King Hezekiah, accounts of whose water channel, walls and building are in the Bible.

What they have not found are human bones, despite the contention of ultra-Orthodox Jews that continuing excavation might disturb the remains of medieval cemeteries. Last season they tried to shut down one area by everything from legal maneuvering to actual physical intervention (pp. 74-75), but in the end were overruled by the Israel Supreme Court, the attorney general and the Knesset, or parliament.

A most exciting activity, though not a "find," has been this program's clearing and cleaning of one of the ancient world's most complex systems—early Jerusalem's network of tunnels, channels and shafts built to carry the crucial water of the Gihon spring to men and fields in times of peace or siege.

There were three separate systems, the most famous of which is the meandering, rock-cut Hezekiah's tunnel, which the Bible says the king ordered dug in the eighth century B.C. to protect the vital water supply from Sennacherib and his menacing Assyrians. Two groups of diggers went to work, one at the mouth of the spring itself and the other at the foot of the hill. Hacking desperately with chisels and probably following a natural fissure in the limestone, they met at last, having cleared a tunnel high enough for a man to walk through erect, saving their water supply and the city.

Water for people and plants

It was the English Capt. Charles Warren who had discovered in 1867 an even earlier tunnel and shaft system leading to the spring. It was most ingenious, comprising a wide, sloping tunnel whose mouth lay within the protective city walls and whose channel led to a 12-meter-deep vertical shaft from which spring water could be drawn in buckets.

The third component of the overall system was the so-called Siloam tunnel, partly underground and partly in exposed channels along the hillside, designed specifically as an irrigation-and-drainage system for the old city and its outlying fields and farms. Water was conducted from the Gihon spring, which spurts hundreds of gallons every few hours into the galleries and channels. At intervals of five to 15 meters the builders cut "windows" to the outer edge of the hill and set small sills of stone in the floor to direct the flow of water outward and downward in a highly sophisticated irrigation system (pp. 80-82).

Hezekiah's tunnel had become a popular candle-

Arab town of Silwan, across Kidron Valley, suggests how City of David may have looked in its prime.

and torchlight tourist excursion before the City of David dig began, but Warren's shaft was completely blocked at its mouth by debris from Parker's 1911 treasure hunt, and most of the Siloam tunnel had disappeared under dumps from other excavations. The City of David diggers have cleared and explored 180 meters of the Siloam irrigation channel to identify its sills and windows, and have rediscovered three openings, which in Israelite times directed rainwater runoff to immense storage pools in the valley.

Shiloh kept looking at Warren's shaft, brooding over how to clear it until, on a Sunday stroll, he saw Israeli alpinists practicing their skills at climbing sheer walls. In 1979 he put three of them to work, scaling the shaft with special equipment from the bottom upward and rigging ropes so that agile archaeologists could navigate it. In 1980, with the help of Mendel Kaplan, the group got South African mining engineers to turn their special skills to clearing the sloping tunnel leading to the shaft.

Their most enthusiastic helper was young archaeologist Don Glick of West Orange, New Jersey, who has been in Israel for ten years as student and digger. "I guess clearing the tunnel wasn't exactly archaeology, but it was a real kick," says he. "We were mostly moving dirt and garbage but it wasn't just any old garbage, it was Captain Warren's garbage."

Working in cramped quarters by the feeble light of a naked bulb on a long cord, the engineers, Glick and his team plunged into the tunnel at 6:30 every morning and refused to come out when the rest of the volunteers quit at 12:30. "We stayed in as long as we could, until Professor Shiloh turned the lights off on us."

Last season saw completion of the clearing, and an expedition geologist was able to make a detailed study, which indicates that the shaft was a natural fault in the rock, exploited and enlarged by the Israelites.

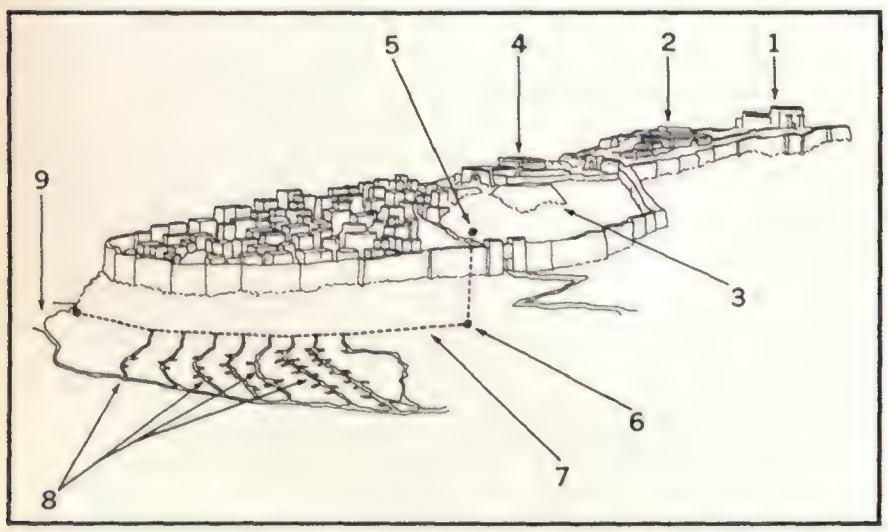
The signs of man-made additions, the chisel marks and steps and erosion marks of ropes used to haul buckets of precious water could be as evocative and popular tourist attractions as Hezekiah's tunnel—as the City of David Society firmly intends they will be. The old water system, together with the city wall, the remains of the houses, the granary and whatever that massive construction is on the hill—all need finally to be cleaned, lighted, shored up and maintained as part of the Archaeological Park, which is growing outside the Turkish walls of the Old City and is already being studied, admired and enjoyed by thousands of weekend strollers and tourists. It will be costly, but Shiloh and his volunteers have faith that somehow more money will appear until the City of David lies fully exposed and safely preserved in the Park itself.

Jerusalem of the Bible

When King David, chosen ruler of the United Kingdom of Israel about 1000 B.C., cast round for a capital his eye fell on the little Jebusite enclave of Jerusalem. It was ideally situated on neutral ground between the tribes of northern Israel and his own Judah to the south, so he stormed in and took it, making it the religious as well as political capital by erecting a Tabernacle to house the sacred Ark of the Covenant.

David's son Solomon, who succeeded him in 961, was a sophisticated and cultured man grown wealthy through trade and commerce. He put Phoenician artisans to work building a splendid temple of stone, rare cypress and cedar on top of Zion (1) and endowed it with carved ivory, enormous wooden cherubim inlaid with gold, two massive golden menorahs and other costly furnishings. He refortified the city and added a royal palace complex (2) almost as impressive as the Temple. When the Queen of Sheba heard of all this she came calling,"with a very great train, with camels that bare spices, and very much gold, and precious stones. . . . And she said to the king . . . until I came, and mine eyes had seen it: and, behold, the half was not told me. . . ." (*I Kings 10:2-7.*)

The painstaking, backbreaking four-year search by Dr. Shiloh and his assistants has turned up no trace of the royal magnificence. However, Lloyd K. Townsend's gouache-and-pencil rendering of how the ancient city may have looked points out other ingenious features which helped it function and thrive. The massive stepped-stone structure (3) probably buttressed a large building, perhaps a citadel (4). One cleverly devised water system was Warren's shaft (5), a vertical descent safe behind the city wall, which allowed water to be drawn up from Gihon spring (6). Another was the Siloam tunnel (7), channeling water to a storage pool (9) while allowing spillover (8) to irrigate fields in the Kidron Valley.



From the Division of Performing Arts

Smithsonian Salutes American Country Music

American country music is the American dream come true—from simple backwoods beginnings to worldwide renown. Now, for the first time, the Smithsonian takes you on a panoramic journey through fifty years of unforgettable music in *The Smithsonian Collection of Classic Country Music*.

What an eventful lifetime this collection recalls! Born in the parlors and sung on the porches of the South and West . . . breaking into the infant radio and record industries of the 1920s . . . playing to a growing legion of fans at the Grand Ole Opry . . . and flooding into the mainstream of American popular song.

Today, country music is "in" from Hollywood to the White House, beloved by millions of Americans young and old across the country. And now, the Smithsonian has gathered the highlights from half a century of American country music into a landmark anthology. When we released *Classic Country Music* to overwhelming critical acclaim, the *New York Times* called it "the country music collection no library of American music should be without."

As a Smithsonian Associate, you recognize the museum's role as a curator of American musical traditions. Perhaps you are among the hundreds of thousands who enthusiastically acquired *The Smithsonian Collection of Classic Jazz*, now world famous for its selection of timeless performances by the finest artists. *Classic Country Music* has been chosen with equal care.

Take a look at the next two pages. If you're a country music lover then you're sure to find many of your favorite songs, as well as some surprises: more than 80 of the 143 selections are available nowhere else. And even if the country music phenomenon is new to you, we think the definitive *Classic Country Music* will make you a fan.

We invite you to experience America's favorite homegrown music through *The Smithsonian Collection of Classic Country Music*. In choosing this collection, you can feel confident that you have selected a Smithsonian classic . . . a permanent addition to the home library that expresses your tastes, your interests and your appreciation of fine music.

← Fold out

The Smithsonian Adds Another National Treasure to Its Collection!

A National Treasure—From Our Collection to Yours!

Thousands of Americans visit the Smithsonian Institution every day to see the priceless symbols of America's great heritage: the Star-Spangled Banner, the Wright brothers' plane—those objects which have come to represent the glories of our nation.

Naturally, each addition to the Smithsonian's collection is a momentous occasion. After much consideration we have selected American Country Music for special recognition as one of America's great achievements. And we are delighted to announce that you will not have to travel to the Smithsonian in order to experience our latest addition; you can acquire this national treasure for your private collection.

Fifty Years of Exuberant Country Music

Now, for the first time ever, the Smithsonian has gathered 143 best-loved songs from over 135 country artists into one Collector's Edition: *The Smithsonian Collection of Classic Country Music.* This landmark anthology includes eight records (or six cassettes) packed with music guaranteed to get your hands clapping, your feet stomping . . . and, at the same time, to provide you with an invaluable insight into America's homegrown music.

A Cornerstone Collection for Your Library

Your Smithsonian Collection opens with the very first documented recording in country music history — the lively "Sallie Gooden" by champion fiddler Eck Robertson, which stands as the greatest performance ever of this classic fiddle tune. Superstar Willie Nelson closes the collection with his gently haunting love song, "Blue Eyes Crying in the Rain" — the 1972 recording that propelled him to stardom. And in between, you'll discover a stupendous gathering of country music favorites and little known delights!

More Than Six Hours of Glorious Music — All in Magnificent Presentation

This wealth of music is all put into historic perspective for you in a 56-page, large-format booklet written by leading country music scholar Bill Malone, who also made the selections for this record package. His expertise and personal insights provide a highly readable overview of country music history and an invaluable selection-by-selection annotation. What's more, the booklet is filled with historic photographs that date back to the earliest days of recorded country music.

The Best From A Glittering Gallery of Country Music Stars

Uncle Dave Macon's *Jordan is a Hard Road to Travel* • Vernon Dalhart's *Wreck of the Old 97* • Gid Tanner and his Skillet Lickers' *Soldier's Joy* • Carter Family's *Wildwood Flower* • Jimmie Rodgers' *Waiting for a Train* • Coon Creek Girls' *Pretty Polly* • Blue Sky Boys' *The East Bound Train* • Rouse Brothers' *Orange Blossom Special* • Red Foley's *Old Shep* • Sons of the Pioneers' *Tumbling Tumbleweeds* • Patsy Montana's *I Want to Be a Cowboy's Sweetheart* • Woody Guthrie's *Do Re Mi* • Bob Wills and his Texas Playboys' *New San Antonio Rose* • Gene Autry's *You Are My Sunshine* • Ernest Tubb's *Walking the Floor over You* • Al Dexter's *Pistol Packin' Mama* • Roy Acuff's *Wabash Cannonball* • Merle Travis' *I Am a Pilgrim* • Tex Ritter's *Rye Whiskey* • Grandpa Jones' *Eight More Miles to Louisville* • Hank Snow's *I'm Moving On* • Pee Wee King's *Tennessee Waltz* • Molly O'Day's *The Tramp on the Street* • Hank Thompson's *The Wild Side of Life* • Kitty Wells' *It Wasn't God Who Made Honky Tonk Angels* • Hank Williams' *I'm So Lonesome I Could Cry* • Johnny Cash's *I Walk the Line* • Tennessee Ernie Ford's *Sixteen Tons* • Ray Price's *City Lights* • Johnny Horton's *The Battle of New Orleans* • Lefty Frizzell's *Long Black Veil* • Marty Robbins' *El Paso* • Patsy Cline's *Faded Love* • Buck Owens' *Excuse Me* • Bill Monroe and his Blue Grass Boys' *Muleskinner Blues* • Flatt and Scruggs' *Earl's Breakdown* • Mac Wiseman's *Dreaming of a Little Cabin* • Osborne Brothers' *Rocky Top* • Doc Watson's *Black Mountain Rag* • Country Gentlemen's *Two Little Boys* • Seldom Scene's *Bottom of the Glass* • Bobby Bare's *Detroit City* • Porter Wagoner's *Green, Green Grass of Home* • Roger Miller's *King of the Road* • Charley Pride's *Is Anybody Going to San Antone?* • Tom T. Hall's *Homecoming* • Dolly Parton's *Coat of Many Colors* • Merle Haggard's *Mama Tried* • Loretta Lynn's *Coal Miner's Daughter* • Tammy Wynette's *D-i-v-o-r-c-e* • George Jones' *The Grand Tour* • *and 92 more!*

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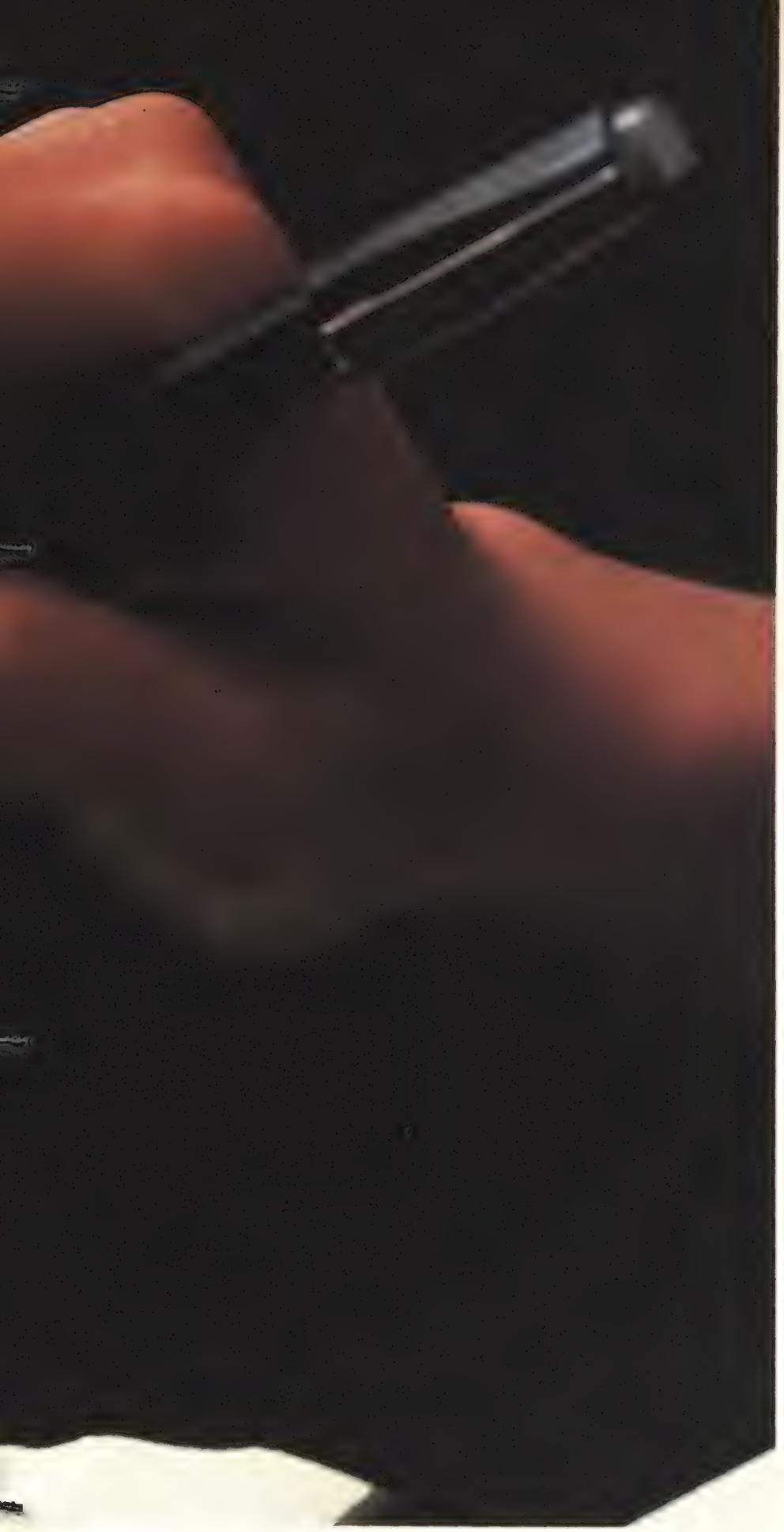
At Disney Studios, an inker does final touchup on the "circuitry" of Jeff Bridges' helmet.

By Michael Schrage

Computer animation comes of age in a studio on 'Dopey Drive'



In TRON, *a wild new Walt Disney movie, the electronic graphics of video games and television ads invade the silver screen*

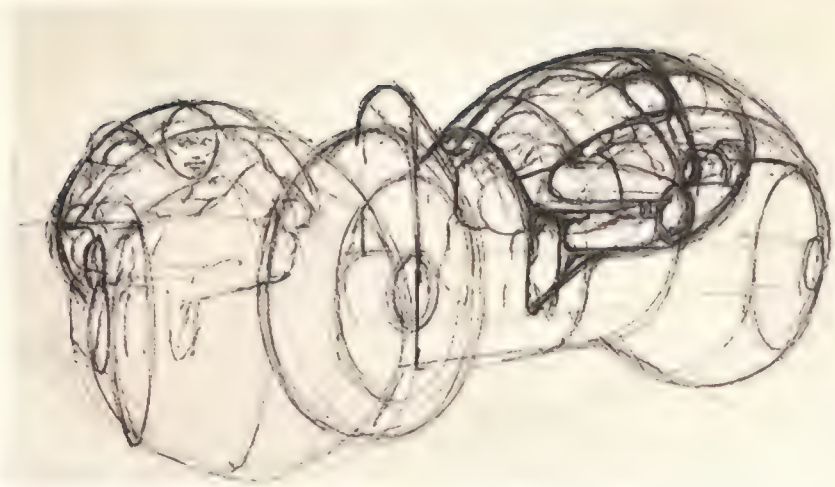
Walt Disney Productions

Computer warrior catches his boomeranglike "identity disk," a weapon that "de-rezzes" its target on impact.

The Disney tradition of animation did not start with a mouse; it began with a little girl named Virginia Davis. In the early 1920s, she starred in Disney's first series, *Alice in Cartoonland*, as an enterprising tot who always finds herself in animated adventures. The series was one of the first that believably blended a live-action character into an animated world and audiences loved it. Its success established Walt Disney in Hollywood where he released Oswald the Rabbit, Mickey Mouse and a whole menagerie of cartoon characters into the mainstream of popular culture. At its peak in the 1930s, Disney animation was simultaneously state-of-the-art and box-office smash.

Half a century later, an $18-million science-fiction epic called *TRON*, being released this month, is reviving some of the magic that has worn off the Disney image over the years. *TRON* (named for one of the electronic warriors in the film) represents the new generation of movie animation. Like *Alice in Cartoon-*

Photographs by Peter Angelo Simon



First step in creation of futuristic Light Cycle for the movie *TRON* is Syd Mead's rough sketch.

At MAGI, cycle is created out of 57 geometric forms (some outlined in red), combined in computer.

land, it features live-action characters in an animated setting; but in this era of the silicon chip, Disney animation is not only being crafted by hand, it is also being generated by computer.

The result is a set of images as visually exciting as anything ever done for the screen. Light and color have a different texture; objects that have never been move in ways that cannot seem to be. It is a quality and style of animation that looks nothing like classic Disney—but, in its own way, might turn out to be neoclassic Disney.

TRON is the story of a group of programmers who are electronically "sucked" into the circuitry of a powerful communications conglomerate's computer. The computer—ruled by its Master Control Program, the MCP (pp. 90-91)—seeks to overthrow the "users"—the people who run the computer. As digitized warriors, the programmers have to battle their way through a video-game grid and computer terrain to face the MCP. Among the film's stars are a young programming genius played by Jeff Bridges, a computer-world villain played by David Warner, and the MCP played by several million digital polygons.

Despite their reputation as tools for business and science, computers are basically symbol manipulators. In the discipline of computer graphics, the computer is not juggling numbers or rearranging words, it is keeping track of points, line segments and surfaces. *TRON* director Steven Lisberger looked at the most advanced techniques in computer graphics and decided they could be brought to the big screen.

The author writes a video column for Rolling Stone *magazine and contributes to other publications on a variety of new media topics.*

With his dark beard and black leather jacket, the 31-year-old Lisberger looks like a Hell's Angel of computers. He is bright and has a quirky sense of humor; to keep his actors "psyched up" for *TRON*, he installed a bank of four video arcade games for play between takes—or to break the tension when a scene was not going well. In his own trailer at Disney Studios in Burbank, Lisberger kept a Battlezone game to divert him in his off moments.

A graduate of the Hill School in Pennsylvania, Lisberger earned a master's degree in film from the Boston Museum of Fine Arts. While at graduate school, Lisberger and a few friends formed Lisberger Studios, specializing in animation. *Cosmic Cartoon*, one of the studio's shorts, won a Student Academy Award nomination in 1973.

The 1976 Olympics inspired Lisberger to conceive *Animalympics*—an animated parody of the summer games featuring different animals competing in the events. The idea ballooned from a $10,000 American Film Institute grant to a million-dollar made-for-television movie that was dropped from the NBC schedule when the Olympic boycott was announced. It eventually appeared on cable TV.

Around that time, Lisberger became interested in the embryonic video-games fad. "I came across video games in the standard way," Lisberger recalls. "I spent Christmas with my wife's family and they'd just bought the new video games so we sat around and played them.

"What intrigued me was that, initially, I had a great fear of technology. My background is in the artistic side and that's just the opposite of, 'Hey, I wanna get a computer and really become Mr. High Tech.' But once I started getting involved with the games I found

Walt Disney Productions

In movie, Light Cycles racing across a video-game grid can execute dazzling, unlimited maneuvers.

that they automatically suggested human aspects. It was really neat to see all this computer stuff becoming subservient and silly enough to play video games. I realized that video games were a bridge to all of computer technology. That, I thought, was wonderful."

Soon Lisberger came to regard a video game as more than blips on a screen. "I looked upon it more as a medium than as a game. It was the first time that animation had gotten involved with technology to break the shackles that had been holding it for 20 or 30 years. It became unpredictable; it was capable of doing things on the spur of the moment that were in no way what you expected it to do. And, at that point, the thing seemed to be living."

Lisberger then began to investigate the computer-graphics field to see if computers could generate the kind of animation a movie like *TRON* would demand. Computer graphics had long been the technological preserve of the military and industrial establishments for engineering and design purposes. The potential for graphics as special effects in movies had, technically, existed for a long while—but no one had taken the gamble to see if they could be tamed for the big screen. In June 1980, Lisberger and producer Donald Kushner approached Tom Wilhite, Disney's vice president for motion-picture production, with the *TRON* idea. They showed him a two-minute reel of some state-of-the-art computer graphics animation. On the strength of that, Wilhite authorized a $50,000 investment to get a better picture of what computers and artists could bring to the movies.

The result, along with the hope that *TRON* would establish an innovative direction for Disney Studios, convinced Wilhite to give the go-ahead—originally at a budget of $11.5 million. It would be Lisberger's first feature. "I was a Walt Disney freak," he says puckishly. "No doubt about it. I'm still a Walt Disney freak," he laughs. "I'm a freak at Walt Disney."

With Disney backing, Lisberger began assembling a creative group to develop a series of images that computers could stylize and animate to bring a believable fantasy world to the large screen. French graphic artist Moebius—one of the founders of the surrealistic *Heavy Metal* magazine—was called in to visualize characters that might inhabit a computer world of light and energy; futurist Syd Mead designed some of the transportation vehicles (above) that would speed down *TRON* highways and byways.

Four companies—Information International, Inc. (also known as Triple-I), MAGI (for Mathematical Applications Group, Inc.), Robert Abel and Associates (best known for their vibrant and surrealistic television commercials for Levi's jeans), and Digital Effects—were assigned different parts of the *TRON* world to bring to life. One of the areas that both Digital Effects and Robert Abel worked on was the opening-title sequence. The bulk of the work on the movie was done by MAGI and Triple-I.

Richard Taylor—tall, bearded and, like Lisberger, encased in a leather jacket—supervised the corporate quartet and set the esthetic tone. "We want to create images that remind you of something you've never seen before," he says with droll sincerity.

Taylor's task was to produce computer imagery that would behave on the screen. The trade-offs and the opportunities to do something truly eye-catching and elegant had to be carefully assessed. Like traditional hand animation, computer animation begins with an empty frame to fill. With the computer as an animator's medium, filling it becomes a job that, quite liter-

Triple-I animator Larry Malone scans polygonal MCP face, "skeleton" for finished version (right).

In film, Master Control Program (MCP) engineers attempted overthrow of its creators—the programmers.

ally, now requires an extra dimension of complexity.

"Conceptually," says Taylor, "you have to start to think in terms of a three-dimensional reality rather than a two-dimensional plane. In computer simulation—and I use the word *simulation* intentionally, not animation—the computer is always thinking of whatever you're dealing with in a three-dimensional Cartesian-coordinate reality. It's just that the result of all that calculation ends up being mapped upon a two-dimensional plane that happens to be film. It depends on where you put the eye in that three-dimensional reality—there is no camera."

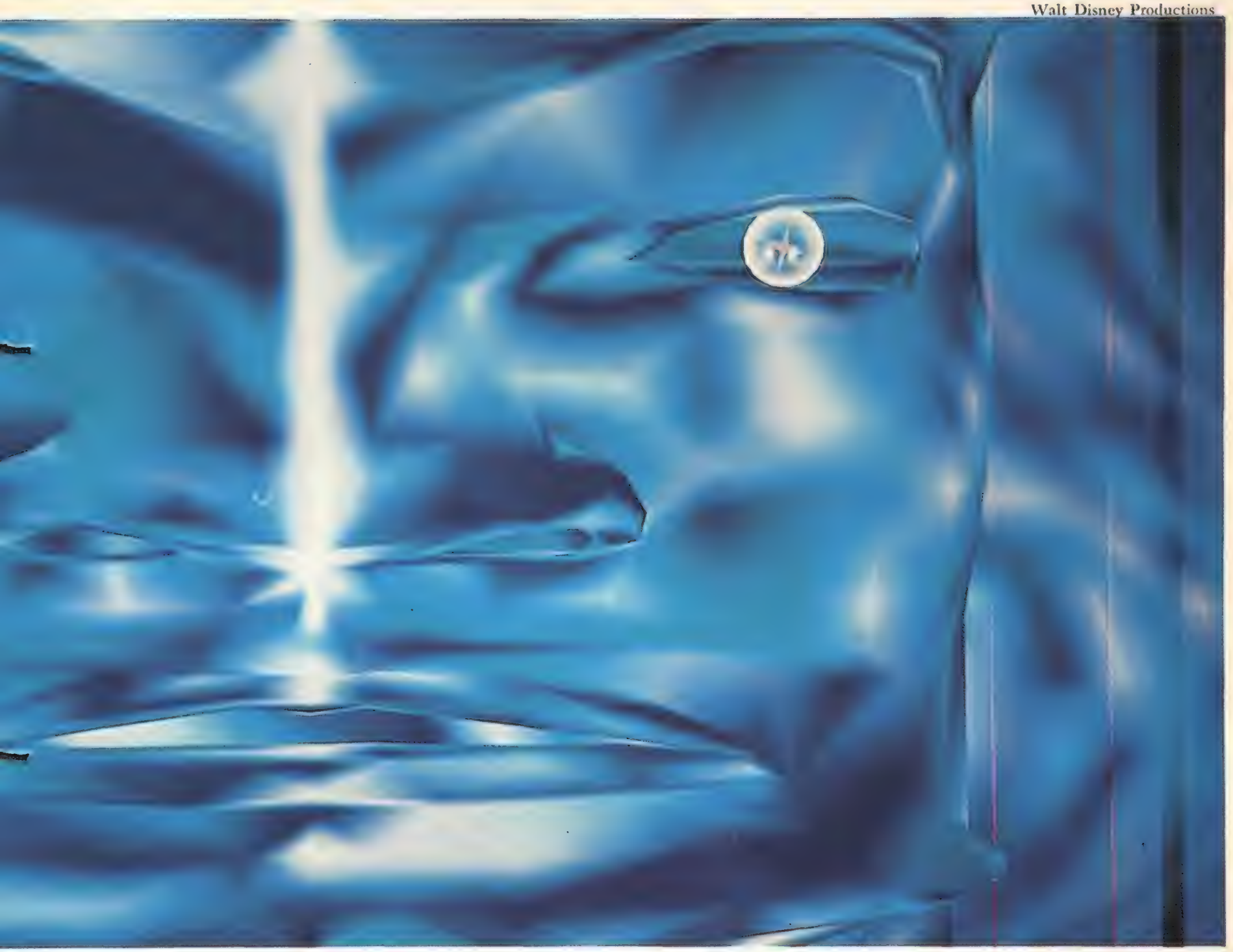
With the computer as the camera, the questions shift from the limitations of the animator and his tools to the animator and his creativity. "The simulated objects themselves," says Taylor, "have no physical limitations. They can pass through each other; metamorphose; they can be infinitely big or small. There is no limit to your point of view. You can be inside an object, pass through its walls and be a million miles away from it two seconds later. There is no limit to your *angle* of view; you can look at something with 180-degree angle of view or one-degree."

Unlike traditional animation, computer animation plots out each point and line with mathematical rigidity and precision. The quality of light, of reflection, of angle, of color are all part of multiple equations interacting to produce an image on the screen.

"It's innately perfect," says Taylor. "If there is one problem with it, it is too perfect." One of the main problems involved in good computer design these days is to make it more human. Taylor muses that he might have to develop a mathematical formula for imperfection to take the geometric edge off his computer simulations in favor of a more massaged, organic quality. The "atom" of computer graphics is the pixel. A pixel is simply a point of light in computer space. Computer images are formed by pixel mosaics and the more pixels an image has, the higher its resolution and quality. A typical color-television picture might hold 300,000 pixels; a single frame of *TRON* can require up to four million.

There are several ways to design a computer system that can create the high-quality three-dimensional imagery required by *TRON*. At Triple-I in Los Angeles—Taylor's base of operations along with the Disney Studio—a computer-graphics habitat, powered by a souped-up Foonly computer, crafts extremely artful pictures with polygons.

Walt Disney Productions



A *TRON* object—for instance, the MCP—is defined down to the last curl and line segment on a sheet of graph paper including a minimum of two views—front and side—so that the shape of the object is represented. The curved surfaces are subdivided into small polygonal facets. After the points of the polygons have been graphically transferred into the computer, the object can be portrayed in its full-color, three-dimensional form.

The design is encoded into the computer on a digital tablet—sort of a drafting board that transmits all lines and squiggles drawn onto a television monitor. The operator encodes the picture by using a hand-held "puck" as a stylus for tracing the lines on the tablet. A tiny bell dings every time the operator formally enters a line into the computer's memory. Once the geometry of the object is established, different properties such as color, transparency and surface characteristics are assigned to it. Then the object is placed into an environment that includes the simulated light conditions, the point of view of the scene's observer, and all the other objects in the scene. The scene-simulation system is programmed to accurately mimic the effects of light and shadow, so that polygons will automatically darken as they go into shadows, or glitter in the simulated sunshine.

After the polygons are defined, says Taylor, there are "tweaker" programs for "bending, twisting and stretching" them until they nestle perfectly on their digital frames. "It's like the bottom of the space shuttle," says Craig Reynolds, a Triple-I image maker, "put together tile by tile."

Disney "choreographers" confer via computer link-up with MAGI in New York about explosion sequence.

Richard Taylor, cosupervisor of visual effects, crashes momentarily over a *TRON* light table.

Assembling high-detail images with the polygon approach takes a great deal of time and lots of polygons. Tracking all those polygons also demands a vast amount of computer memory for each object. It took five Triple-I animators six months to produce six minutes of full animation material for *TRON*.

The MAGI approach to computer imagery is radically different. Tucked away in a science park in Elmsford, New York, MAGI is best known for its computer-aided design software. "We represent graphics with solids," says Phillip Mittelman, MAGI's founder and president. "As far as we know, we're the only company that works that way."

Sculpting images on a screen

Basically, MAGI starts out with a set of computer-generated three-dimensional building blocks on the screen—spheres, cones, cylinders, and so forth—and mixes, blends and sculpts them until they perfectly model the desired image. For example, a chair built the MAGI way might consist of four long, thin cylinders as legs with the bottom slice of a sphere perched atop them as the seat and a slightly warped oblong serving as the back; a pair of skinny ellipsoids might be the armrests. By juggling with solids, says Mittelman, MAGI can quickly—within a few days—model or create complex and intricate structures.

MAGI's computer graphics program, called Synthavision, relies heavily upon a technique known as ray tracing. It was inspired by, of all things, studies on nuclear physics.

Back in 1966, Mittelman was a physicist researching aspects of reactor design. Monitoring the flow of radiation is crucial to efficient reactor performance and Mittelman's group developed a computer simulation program that "bounced" radiation off the walls of various simulated reactor interiors to trace its path. This resulted in a virtual three-dimensional view of the reactor. "Well," says Mittelman, a hearty-looking technocrat, "it didn't take much to realize that light rays are similar to radiation rays." By having the computer simulate rays of light and color, Mittelman was able to generate a different approach to three-dimensional computer graphics.

One seeming advantage of the MAGI method over the Triple-I approach is that it is easier to animate the objects because the computer has only to track a few moving solids instead of working with a complex network of polygons.

MAGI tells its creation how to move on the screen with a director's language—a fairly easy-to-understand but difficult-to-implement set of commands patterned on how a director coordinates all his people and props on the set. "It only takes a couple of days to under-

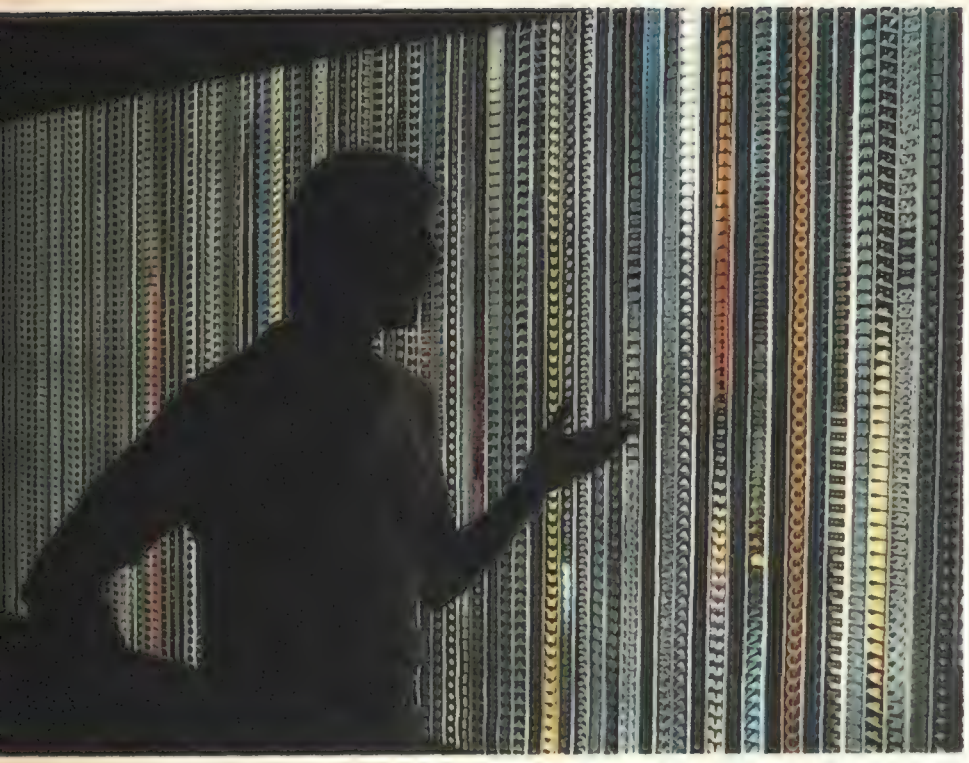
Taking a break from production, Jeff Bridges (right) and Steve Lisberger (center) hit a local arcade.

stand it," says Chris Wedge, a fair-haired young fellow trained as a stop-action animator at State University of New York at Purchase. "The real problem is figuring out how to make the motion look real." Wedge has to draw on his experience animating real solid objects to enable the computer to let its imaginary solids perform in a way that the eye will accept.

Wedge is trying to get a "Recognizer"—an ominous horseshoe-shaped robot that soars above the plains of the *TRON* world—to twist and move along a certain path. Using the director's language, Wedge maps a series of coordinates on the X, Y and Z axes along which he wants the Recognizer to travel. He also tells the Recognizer how quickly to pass through certain point-sets; when to accelerate and when to stop. For the sake of speed, Wedge can work with what are the equivalents of rough sketches of the Recognizer for, as he puts it, "real time-motion testing." He literally puts the Recognizer through its paces, stepping it frame by frame to see if the device is twisting and turning as it moves along the programmed path. Wedge has all the tools to assure that the motion seems real—but he determines what "real" looks like.

Perhaps unfairly, the production of *TRON* divided MAGI and Triple-I into different camps: the Imagists and the Dynamists. The distinction is somewhat representative of the computer-graphics field at large. Imagists are primarily concerned with picture quality and texture, making sure that every pixel is illuminated to the precise density. Dynamists, on the other hand, are obsessed with motion. Objects have to wriggle, shake, slide and soar in a way that will not make the eye suspicious. If that means picture quality is sacrificed a bit, well, that is a necessary price; there are always trade-offs.

"We felt that Triple-I was much more geared to beautiful imagery," says Disney's Bill Kroyer. "They put more emphasis on encoding objects than on



At his studio, Bob Abel examines *TRON* and other clients' filmstrips mounted on vertical light box.

choreographing motion, while MAGI was much more concerned with motion. So Triple-I's stuff tends to be glossier in appearance; MAGI's tends to have more dynamic action."

Consequently, MAGI was assigned the hard-action animation sequences whereas the Triple-I scenes have simpler action, with emphasis on visual beauty. Kroyer, a blond Midwesterner, is a nine-year veteran of traditional character animation. Along with partner Jerry Rees, his chief concern with *TRON* was assuring a delicate balance between the competing desires for lush imagery and believable motion.

"Our screen credit," says Kroyer, "will read 'Computer-Image Choreographers.' " The dance metaphor is deliberate since Kroyer and Rees look at image and motion as virtually indistinguishable. "You have to look at animation not just as a drawing," explains Kroyer, "but as a symbol of movement—even if it's only a smear of color."

Motion always complicates things. It changes angles and perspectives; light has to fall in different ways across a moving surface; colors shift, yet there has to be a continuity of detail as the object moves from frame to frame. Freehand animation is consequently an extremely arduous task, and reconciling character and action is the crux of the challenge for animators. They often took shortcuts, as with Mickey Mouse. Look carefully at his ears as Mickey leaps from scene to scene. "The ears were always circles," said Walt Disney, the master, "so they could be drawn the same, no matter how he turned his head." And one reason why Mickey's begloved hand has only four fingers, said Disney, is that "it meant one less finger to animate." It might seem odd to say, but detail is the bane of traditional hand animation.

Computers, on the other hand, thrive on detail. They could be used to re-create Bambi and Thumper —but that is not what they represent. The goal of entertainment that is believable is still the same—but the computer changes the old rules and increases the new possibilities.

"Usually," says Jerry Rees, a 25-year-old animator who used to hang around the Disney lot as a child, "you have an idea and it's great—but you have to weed out things either because of cost or because it would take 40 years to draw. This changes the way I think about film—I think more freely now. We had a scene where the 'Light Cycles'—futuristic 'motorcycles' —were racing down the canyon and we wanted to convey a feeling of fear as they came to the edge," he continues. "We had a 'camera' view from behind the cycles and a camera view from the top. We combined them and swept up to the top view as the Light Cycles abruptly stopped at the edge. It would be almost impossible to do a scene like that with either traditional animation or live action."

One problem is the dreaded jaggies

Even so, hand animation remains an important medium. At one stage, says Rees, "I was trying to get something to rebound off the wall and I thought a mathematical equation would do it for me. It couldn't and I had to block out the sequence by myself."

Even worse is when the computer-graphics programs themselves go awry. "Yeah," says Richard Taylor, "the jaggies or aliasing, and dropouts—you name it, we have it."

The dreaded jaggies occur if polygons are not smoothed precisely into their allotted spaces or if the fit is only good in one dimension; as the object rotates, a jagged set of steps crops up along a curved edge of the image. It looks like the top of a soup can that has been through an electric can opener.

Dropouts are just that: slivers of the object just drop from sight, leaving holes.

Since computer-graphics systems have so much information to track and because people feeding the system information do not always structure it properly, computers develop flaws. Images unravel or vanish as they are called upon to perform. All media have their limitations—in the case of computer images, the infinity of options creates an equally infinite opportunity for error.

Nowhere does this become more evident than in the daily *TRON* rushes at the animation building, located at the corner of Mickey Avenue and Dopey Drive at

Disney Studios. Animators and color people file into a screening room that looks like a junior high school auditorium to view scenes of *TRON* animation that will eventually be edited into the final film. Richard Taylor chairs the proceedings as the lights darken and the projectionist starts looping the segments on the screen. The first loop features one of the live-action characters kneeling by a crystal pool for a drink. His uniform has a soft luminous glow streaked by bright bands of color. As he lies flat on his stomach to drink deeper, his stomach completely disappears. Someone starts to laugh. The scene is played over and over again. Taylor identifies the problem and calls out "RDIP!" That means ReDoIfPossible.

The next loop has a live-action character swirling in the incredibly high-tech environment of a *TRON* tank that is chasing after the heroes. Taylor yells out, "A hero!" That shot is correct.

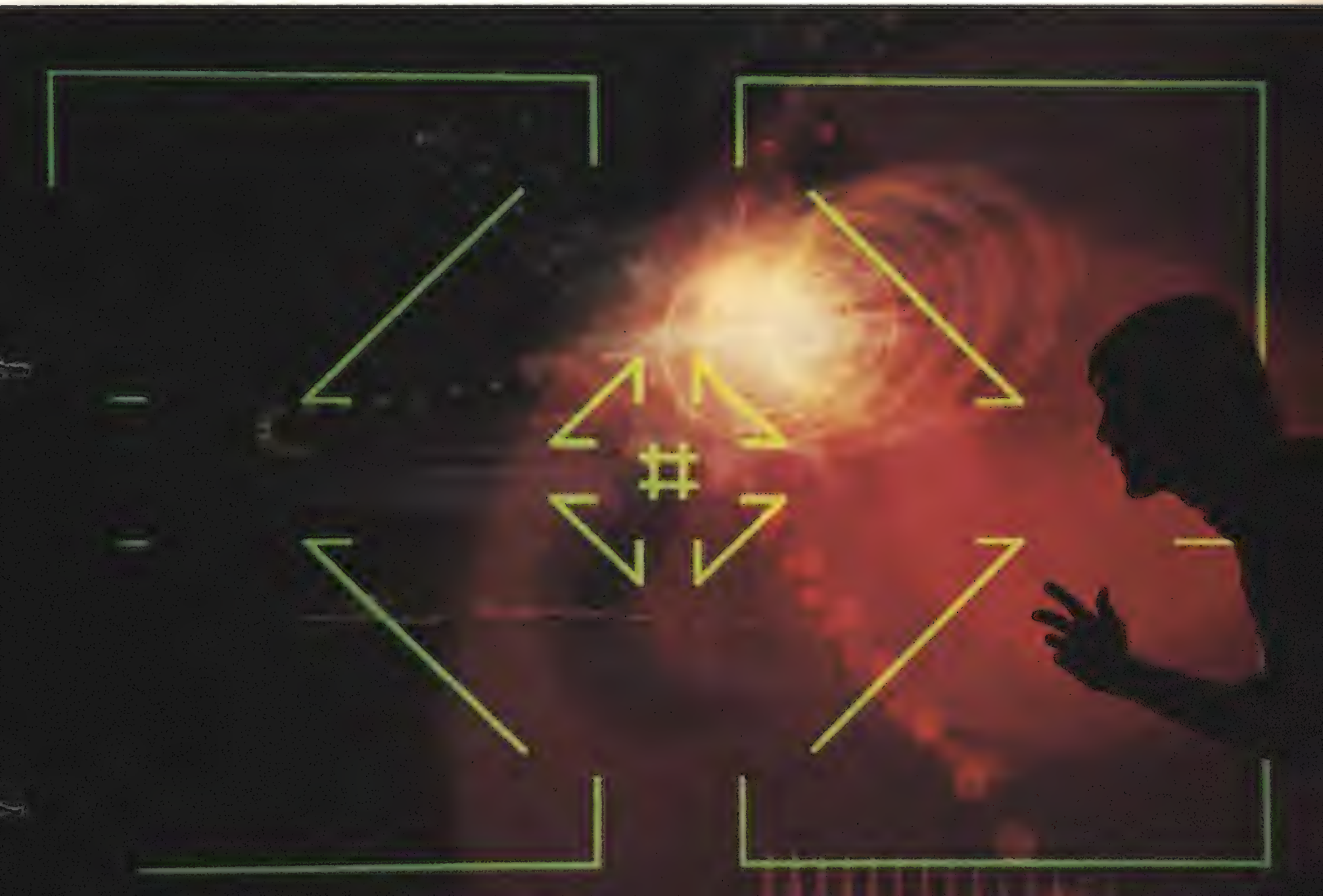
A few more loops go by and then one comes on screen that elicits more snickering from the audience. A few of the live-action characters are descending a set of hard geometric steps. Unfortunately, they sometimes seem to be stepping on thin air as they miss the step entirely, or sink to the thigh in the block.

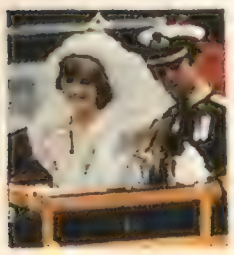
Taylor explains that integrating the live action and the computer graphics is a real headache. The actors have to perform against a backdrop of black velvet with really no idea whatsoever of what their computer-generated environment is going to look like on the screen. Sometimes the animation is not "matted," as it is called, to the live action as it should be. The result is a crazy-quilt mix of images that do not match.

Taylor expects that sometime in the near future a digital film printer will be developed that imprints computer images directly on the film while a computer coordinates live action and animation. When that happens, Taylor predicts, the marriage of computer to celluloid will change the nature of movies forever. But *TRON* is the first step. "It made the crack in the wall," he says. "It's the beginning of a technical renaissance in the film industry."

With the computer as lens and paintbrush all in one, it is appropriately ironic that the first film to successfully use computer graphics is about a computer.

In Disney animation building, tension runs high as *TRON* computer-generated footage is screened.





Stamps depicted are artist's concepts for illustrative purposes.

The Royal Wedding Philatelic Panels

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A landmark philatelic event has just taken place. Many British Commonwealth nations have joined in a multinational "omnibus issue" honoring Princess Diana, the future Queen, on the occasion of her twenty-first birthday. Each of these nations has issued four new stamps. One of the four depicts a scene from the Royal Wedding, and another presents a candid portrait of Princess Diana—a different wedding scene and a different portrait for each participating nation. A third stamp features a formal photographic portrait of Diana, *authorized and approved by the Princess herself for this special occasion.* A fourth stamp depicts the Official Coat of Arms of the issuing nation.

Worldwide collector interest in these stamps—and others, too, which have been issued by countries around the world on this occasion—is extremely high. Altogether, approximately 40 nations have issued new stamps honoring Princess Diana and the Wedding of the Century. The best way to own these

prized stamps is on the magnificent *Royal Wedding Philatelic Panels,* available in the United States exclusively from the Postal Commemorative Society.

Royal Wedding Philatelic Panels— the ultimate philatelic tribute!

The Postal Commemorative Society is now acquiring the most significant of these new stamps, along with some historic stamps previously issued on the occasion of the wedding itself. These stamps will be combined with stunning full-color photographs of the wedding to create magnificent 10″ x 13″ *Royal Wedding Philatelic Panels*—one panel for each nation. The stamps will be preserved forever in perfect mint condition under a clear vinyl shield. In years to come, they will be treasured philatelic rarities—and still like new! (Many of the stamps have a high face value to start with—and they were issued in limited quantities.)

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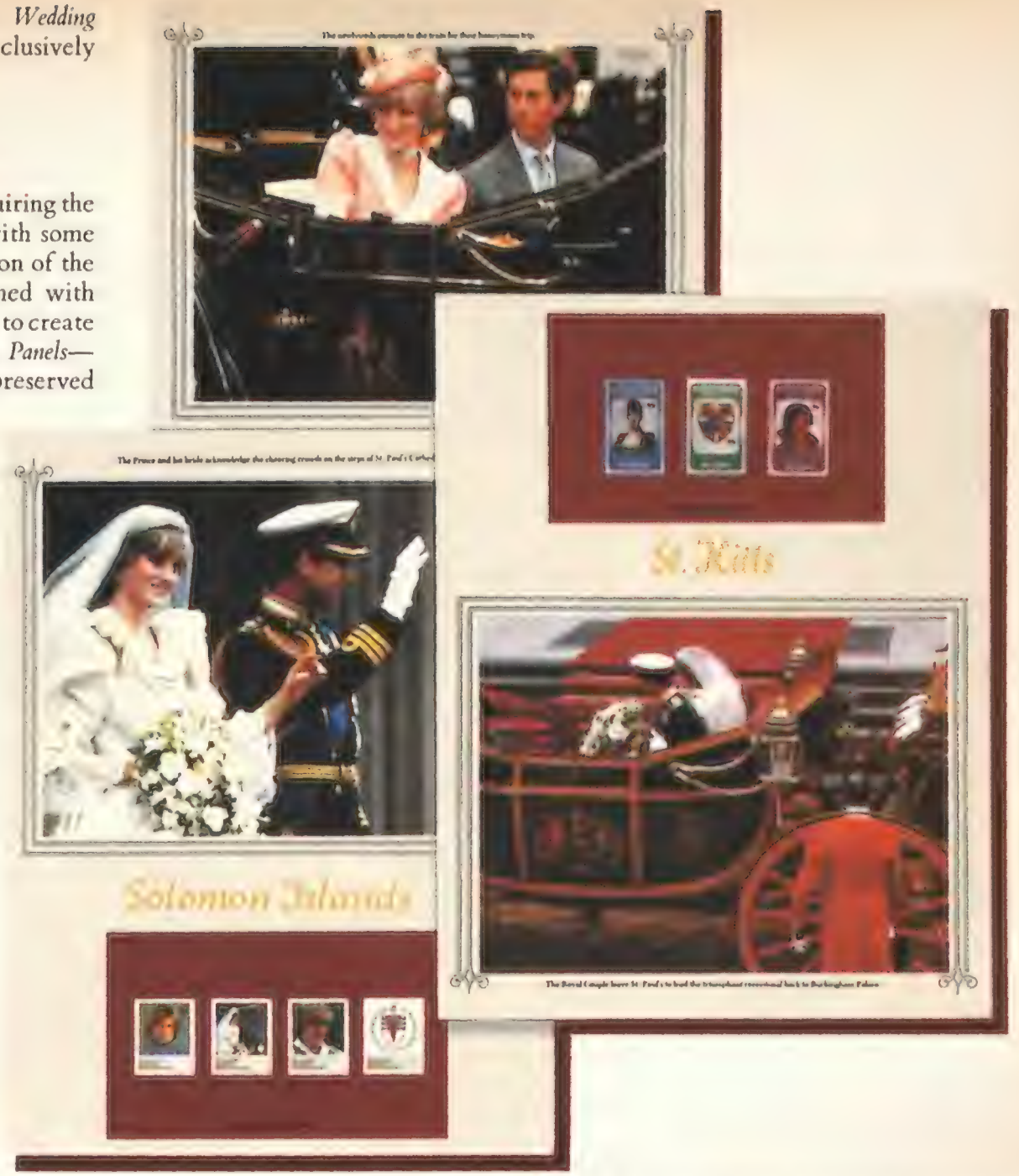

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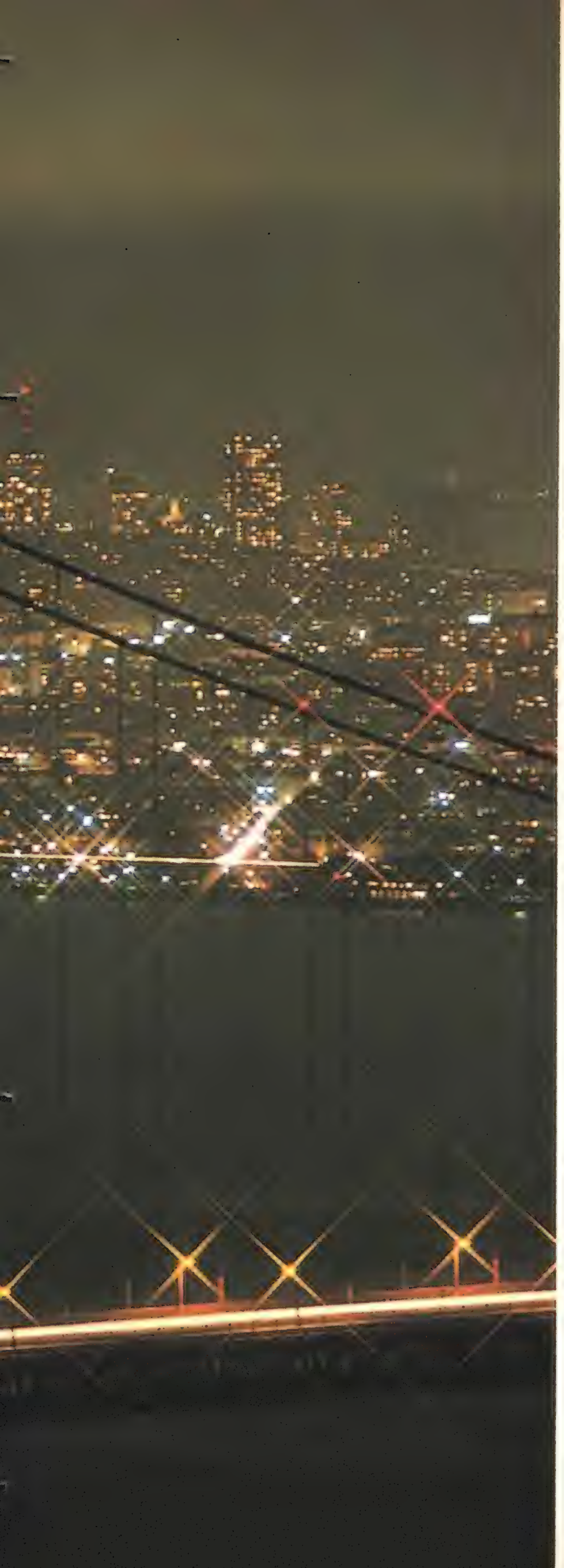

By Jack Fincher

The 'impossible' bridge that spans the Golden Gate

San Francisco's 'curve of soaring steel' cost $27 million and 11 lives; as it approaches its 50th birthday it's solvent and busy as ever

San Francisco City and County Supervisor John L. Molinari once found himself stuck at the Washington, D.C., National Airport when he failed to make connections to the West Coast. Molinari was angry, the airline clerk unhelpful. Sorry; all planes were booked.

Then she noticed the figured gold pin on his lapel. "Isn't that the Golden Gate Bridge?" she asked. Yes, replied Molinari, who at the time was president of the bridge district's board of directors. The woman flashed him a smile. "Let me check again. Maybe there *is* something we can do." A flurry of calls, and a seat opened up. Minutes later Molinari was winging west, musing on the bridge's enduring power to win friends and influence people, even at a distance.

Indeed, few scenic attractions in the nation are more familiar or compelling than the Golden Gate Bridge. As it approaches its golden anniversary in 1987, however, few know or remember that this lyrically swinging achievement initially was dismissed as something that could not be built. Or that once built, it survived serious trauma: only once—in 1951—the bridge had to be closed because the 69-mph winds' unprecedented velocity set up a torsional motion that caused one side of the deck to rear about 12 feet above the other (the bridge deck since that time has been

City lights of San Francisco glow behind cables and 746-foot north tower of the handsome structure.

Chief engineer Joseph Strauss, left, and Clifford Paine, his principal assistant, gaze up at their bridge.

reinforced with cross-bracing beneath the roadway).

If few know the bridge for the engineering feat it is, fewer still know that its builder was a poet. Cincinnati-born Joseph B. Strauss (left), a man of steel barely five feet tall, wrote solemn (and awful) odes to the towering majesty of the redwoods when not busy projecting on paper with slide rule and French curve.

In the process, Strauss bequeathed standards of worker safety that defied what was then axiomatic: the belief that for every million dollars spent, a life would be lost. Strauss found these grim mathematics unacceptable. He resolved to fight them.

The general idea for a bridge was first voiced by Joshua Norton, better known as "Emperor Norton I," a demented, down-and-out '49er who had lost both his shirt and his buttons speculating on rice in a city with a good-sized Chinese community. No one paid much attention when he immortalized his vision in a decree published by the *Oakland Daily News* of August 18, 1869: "We, Norton I, *Dei Gratia,* Emperor of the United States and Protector of Mexico, do order and direct . . . that a suspension bridge be constructed from . . . Oakland Point to Yerba Buena [Island], from thence to the mountain range of [Sausalito], and from thence to the Farallones. . . ."

A few years later, plans to span both San Francisco Bay (from the city to Oakland) and the turbulent mouth of the Golden Gate strait were unveiled by two railroad tycoons, Charles Crocker and Leland Stanford, the former governor. But elected officials were suspicious of Stanford, who in the words of one historian had "practically" invented "the term 'conflict of interest' " by bleeding the federally subsidized railroad white to put his own companies that supplied it solidly in the black. City fathers found the idea so unappetizing they facetiously dumped the entire project on their hospital committee, where it died a merciful death.

A challenge with an "if" in it

The concept of a Golden Gate bridge was not revived until 1916. Then an ex-engineering student-turned-journalist, one James H. Wilkins, came out in print in favor of just such a suspension bridge, with a center span of 3,000 feet—nearly twice as long as any in existence. It would be, Wilkins wrote to kick off a two-year campaign in the *San Francisco Bulletin,* both the key to faster economic development and an engineering coup to "dwarf and overshadow" the "Colossus of Rhodes and the Pharos of Alexandria."

Swayed by such editorial eloquence, City Engineer M. M. O'Shaughnessy began buttonholing reputable bridge engineers across the country with an oblique challenge: if such a bridge could be built, it probably

The Gate is spanned and the bridge is abuilding in this picture looking toward Marin tower in 1935.

would cost up to $100 million. Could any of them do it for less?

Joseph Strauss of Chicago knew that he could, and for a lot less than $100 million—as befitted an engineer who for his graduate thesis had designed a bridge joining North America and Asia across the ice-clogged, weather-plagued, 55-mile-wide Bering Strait. As the destiny-driven Strauss himself would write one day, "Every span is something that 'can't be done' until the men in steel helmets have driven their last rivet .... Trajan heard it when he conquered the Danube 1800 years ago.... Don't be afraid to dream!"

But dreams need a bedrock in reality. In 1920 Strauss asked for and got a survey of the channel floor, and the following year submitted his plans. The $17-million design proved such an unmitigated horror that one critic decried it as looking "as if it were supported in the mouths of two grotesque steel beetles crawling out from either shore. . . ." Local officials found it politic to table the controversial drawings for 17 months as public debate quickened. Early on, the project reached a climax of sorts when a physically imposing dowager rose to demand of a pro-bridge engineering-school dean from the University of California: "Professor, don't you think it would be a sacrilege to put a man-made object across our God-created Golden Gate?" "Madam," shot back the professor, "do you feel that that man-made lavaliere you're wearing detracts from your God-created bosom?"

For the next dozen years or so, advocates had their hands full just beating down their opponents. Several favorable court rulings had to be made, an enabling act from the state legislature signed into law, and two federal hearings held to secure final approval from the U.S. War Department.

Before the $35-million bond issue could pass in the Depression era, it took an extraordinary guarantee that local workers would have first crack at jobs. And it took, too, a civic uprising against the Southern Pacific Railroad, which controlled the profitable ferry monopoly and only ceased its sly obstruction when many angry San Franciscans instituted a mass boycott. Finally, it took a new design for the bridge. In the decade since his original concept of a hybrid cantilever-suspension span, Strauss had undergone a sea change of head and heart. Advances in metallurgy and the theory of lateral-force deflection—not to mention insistent pressure from his chief assistant for design

The author, a frequent contributor to SMITHSONIAN, *lives in Oregon; he wrote about the Appalachian mountain roadside theater in the December 1981 issue.*

Balanced on wire footbridge ropes, an ironworker adjusts turnbuckle, part of the catwalk construction.

and construction, Clifford E. Paine (p. 100)—had convinced him that a pure-suspension bridge was now feasible and, in fact, would be better. Gone were esthetic objections such as the ugly metallic beetles. What was left would simply be one span, with a lilting Art Deco configuration—what another poet, Henry May, would christen a "curve of soaring steel, graceful and confident over infinity"—if it could be built.

Massive concrete anchorages that could resist a cable pull of 120,000 tons each went in months after the first official spade of earth was turned in February 1933, a straightforward task of scooping out hillsides and pouring in the first of enough concrete ultimately to pave two sidewalks from San Francisco to New York. The tower-bearing pier on the relatively sheltered north end was equally conventional. Cells of wooden cribbing were bolted together on barges, loaded with broken rock, and sunk into place. They then were faced with sheet piling, backed with rock-filled dikes, and the interior of the cofferdam pumped dry. Into it cascaded a 98-million-pound "river" of concrete. In barely 100 days 90 men had finished the job.

The foundation of the south pier, however, had to be laid under 100 feet of moving water (the tide slackened for only 20 minutes at each turn). How, then, erect a pier 44 feet above sea level, one poured into steel boxes that divers would have to bolt together under racing water?

The catwalk of redwood planks is in place, but not yet the wire-rope handrails as a safety device.

Strauss and his staff hit upon a revolutionary plan. They would construct a 1,125-foot-long trestle out from shore and ring the pier site with a permanent 100-foot-deep fender that could provide another working cofferdam. "Without question," he later wrote, "the most difficult engineering feat . . . ever tackled."

As divers descended, among the battles they faced would be the bends and treacherous riptides that threatened to tear away their air hoses and hurl them against the steel. Groping through murky blackness, they set charges, scoured away shattered rock with pressure hoses, removed concrete forms that frequently were wrenched from their grasp by the intense pressure of the depths, fitted the fender's panels to I-beams and bolted them down—all by feel.

No sooner had the trestle been completed than a freighter crashed through it in dense fog. Rebuilt, the trestle lasted until a fierce storm carried off another 800 feet, smashing five fender units to pieces and twist-

ing its 50-ton guide frame into a steel pretzel. Again, it was rebuilt. Strauss intended to float into the fender —and sink as a form for concrete—a 10,800-ton caisson about as high as a four-story building. Once it was in place, however, another storm blew in, tossing the enormous caisson like a cork and converting it to a catastrophic battering ram.

Reluctantly, Strauss ordered it removed and scuttled. Three men and 800 pounds of dynamite were put aboard the massive hulk and towed out to sea. Five miles out the towlines snapped. The caisson became a wind-driven land mine menacing steamer lanes for the next six hours. Finally two Coast Guard cutters rescued the crew and finished towing the caisson out to sea, where it was blown up.

Strauss decided now to close and dewater the fender and build the south pier inside it. Millions of gallons of seawater were pumped out, leaving high and dry hundreds of pounds of cod, bass, crab and small abalone that workers took home for dinner in gunnysacks.

A painter needing the "skills of a contortionist" reaches under a box girder to paint a hidden corner.

The towers, tall as 75-story buildings, next rose one after the other amid a racketing symphony of rivet guns stitching steel. The tower interiors were extensively honeycombed for strength. The result was a step-tapered labyrinth of hollow, three-foot-square boxes with 23 miles of ladder and 90 different routes that required a 26-page manual to navigate. (Two workers once got lost and spent a night getting out.) Eighty-three thousand tons of prefabricated steel sections were shipped from Eastern factories through the Panama Canal, raised by traveling derrick, and guided into place by workers who then fastened them by slamming temporary bolts into holes.

Out on the towers and cable-making catwalks, according to Stephen Cassady in *Spanning the Gate*, his recent history of the building of the bridge, bridgemen soon learned the truth of a native adage: "The coldest winter I ever spent was a summer in San Francisco." Recalled one, "There's two kinds of freezing in bridge work. One is where you're so scared you can't move a muscle. . . . But the real cold was a bigger problem. We wore three sweaters up on those catwalks and still couldn't keep warm." In June 1935 an earthquake occurred, causing the south tower, wrote Cassady, to vibrate like"some giant tuning fork. . .struck by a mammoth and malicious rubber hammer."

Soon both towers were completed and the job of

spanning the gap between them—literally spinning 80,000 miles of wire out of the ocean air—fell to John A. Roebling's Sons Company of Trenton, New Jersey. Roeblings, founded by the family that built the Brooklyn Bridge (SMITHSONIAN, October 1972), had won the contract in fierce bidding. To make a profit out of the $5.9-million bid, the firm had to spin 265 tons a day, four times what existing methods had produced until then.

Roeblings had several things going for it: one was a cold-drawn steel wire that had a unit strength of 200,000 pounds per square inch; another was its own constantly improved "spinning wheels," an integrated system of moving shuttles that turned the towers and abutments into a giant loom; third was a redundant communications network of phones, lights, bells, horns and semaphore signals.

The 36⅜-inch cables from which the nearly one-million-ton bridge would hang contained 27,572 separate wires bunched into 61 strands. The cable making began with two spinning wheels per tram to double production. With work still falling behind, one of the Roeblings men had a brainstorm. If each of the hauling trams could carry two wheels, why not three? A third was installed and the four trams were put to work around the clock. In May 1936, two months ahead of schedule, spinning was completed.

The following month, stationary derricks at either tower began lifting steel from barges and passing it to traveling derricks, which started laying the deck from both ends. It was at once the easiest stage and the most dangerous. Bridgemen had to connect and rivet while balanced on six-to-eight-inch girder flanges without handrails or walkways—22 stories above open water.

Strauss, meanwhile, had set out to cheat the one-life/$1-million adage in every way he could. His foremen had orders to sack any man who "stunted." Doctors prescribed diets for dizziness, sauerkraut juice for hangovers, respirator masks for those working inside the tower cells, goggles for snow blindness from the dazzle of sunlight off the low-lying fogbanks. Strauss himself insisted on primitive safety belts and hard hats, hand ropes, cleatlike projections, and occasional wire-released steel planks to prevent the spread of fire on catwalks—even clean hands to prevent infection. When riveters in the towers started losing their hair and teeth and coming down with appendicitislike symptoms, the cause was finally diagnosed as lead poisoning from hot paint vapors. Protective clothing was ordered and the cells in the towers were promptly ventilated with compressed air.

It was Strauss and Paine who decided to fight the fear and hazard of the open deck by stringing a safety net below. Three months later a carpenter who was knocked off the bridge during a gale became the first of 19 men to land safely in the net and join what became known as the "Halfway to Hell Club."

Almost four years—25 million man-hours—elapsed before the first life was lost. The bridge opening was six months away when a worker was crushed by the falling arm of a derrick.

Disaster goes before a triumph

Now it is February 17, 1937. Fourteen men are aboard a traveling scaffold suspended by four brackets from wheels slung beneath the deck. As it moves, they are tearing loose the used concrete forms and tossing them down into the safety net, to be collected later. Suddenly, with a series of hideous cracks, the platform wrenches loose from its brackets, corner by corner, and the ten-ton scaffold with its screaming human cargo (two manage to jump free) falls into the net. A lull, and then, like the deadly *pop-pop-pop* of a machine gun, the ropes lashing the net to the bridge give way in a slow-motion nightmare, spilling the men into space and the Pacific (p. 106). Raining debris, the net descends upon them like a burial shroud. All but two who fall perish. None can be identified until all the workers have lined up and turned in their time cards.

Metal failure was officially blamed, and new stripping scaffolds were soon put in operation. Lost in the funereal wake was a stunning statistic: Strauss had put the adjusted cost of construction at $27,165,000; it actually was $40,000 less, not counting easement rights, financing, engineering and administrative fees that brought the final figure to $1.3 million less than the $35-million bond issue.

On May 27, 1937, San Francisco gave its brand-new bridge an epic birthday party. It erupted in a week-long orgy of emotion and energy that was rivaled only by the celebration eight years later on V-J day.

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Arrows point to men hanging in collapsed safety net in historic 1937 photograph. Ten perished in bay.

At 6 A.M. barriers fell and the first of more than 200,000 pedestrians (opposite) surged through turnstiles with such a flood of nickels that the coin boxes broke and water pails had to be used. Some people ran, some roller-skated, and some pushed babies in perambulators.

Next day the bridge was thrown open to auto traffic. As President Franklin D. Roosevelt pushed a telegraph key in the White House, 100 skyrockets from the toll plaza sizzled aloft; 500 aircraft from Navy carriers screamed overhead; and every horn, bell, siren and whistle in the city, it seemed, shrieked in unison.

Less than three months after the bridge opened, a 49-year-old bargeman took a bus to the San Francisco bridgehead, walked across and halfway back with a professor he had met on the bus, took off his coat and vest and said, "This is where I get off." Climbing the four-foot rail he jumped—entering the record books as the first of some 730 known victims who have since turned its exalted heights into the most favored suicide spot in the Western world.

Today a permanent suicide barrier and a second deck to handle traffic remain the two sticking points in any serious discussion of the bridge's future.

At current prices, the job of replacing the salt-corroded deck begun this year will cost $50 million, or nearly twice as much as the entire bridge structure cost originally. From that perspective, it is all the more remarkable that the bridge, which had a replacement cost of $200 million by 1970, not only paid off all of its bonds by 1971, but did so on bridge tolls alone, without a penny of contingency tax money.

You have to wonder what Joseph Strauss would have thought about all this. He died a year after his masterpiece was dedicated. Not that the specter of Thanatos brooding over the bridge ever quite succeeded in stripping Strauss of his pride. On the bridge's fourth birthday, a bronze statue of the engineer—suitably larger than life at eight feet—was unveiled by his widow. Today, as it stands near the San Francisco-side tollbooth, you can almost hear again the words he uttered when it was finished: "If the entire 4,200 feet of [main] span were jammed with loaded limousines standing bumper to bumper in all six traffic lanes; if the 10½-foot sidewalks on both sides were crowded their full length with foot passengers standing shoulder to shoulder; if a 90-mile gale . . . should suddenly press against the huge exposed side of the bridge, and if at that moment someone should saw both cables halfway through—why, the Golden Gate Bridge would stand!"

On Pedestrian Day, May 27, 1937, the vanguard of 200,000 people storms across the new bridge.

If you're like most people, you're probably wasting a lot of time and energy each year on oil changes.

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*Add oil as needed. New car owners follow warranty instructions. Diesel owners follow manufacturer's instructions.

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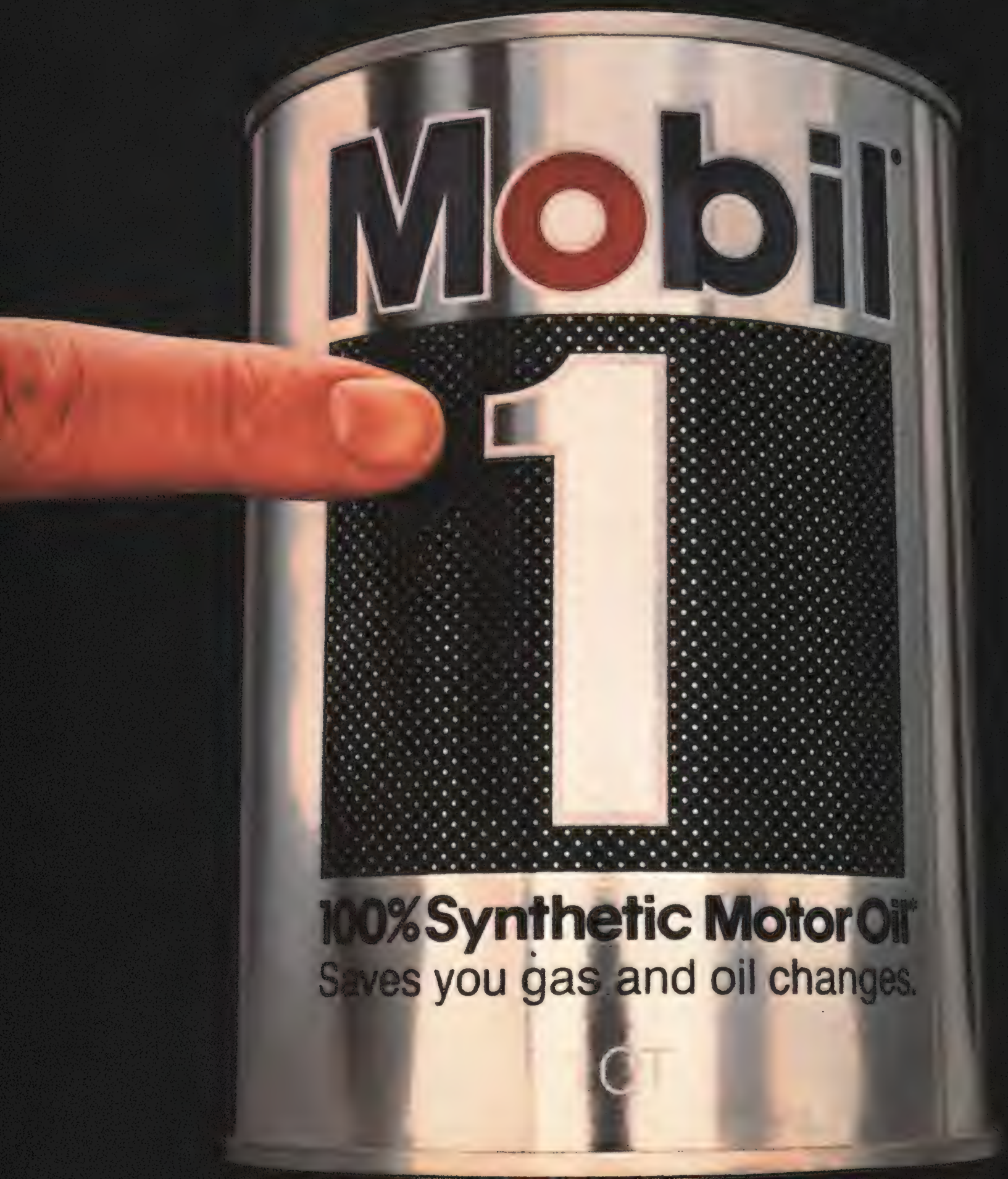

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By Richard L. Williams

Their hearts are in the Highlands—of North Carolina

From around the globe kilted pipers, bonny dancers and caber-heaving 'heavies' gather in a sporting celebration of Scottish heritage

This could be the Highlands of Scotland, remembered or imagined. Mists drift down from the rocky promontories, and at times rain squalls, lightning and thunder crash onto the wooded hills. Pale rhododendrons bloom along every road and pathway, littering the forest floor with their lavender petals. Floating in the air is the eerie, off-key (to me) sound of bagpipes and the muffled tattoo of drums. Placid sunshine takes turns with the wet summer storms.

But it is not Scotland, not by 3,500 miles. This is MacRae Meadows high on Grandfather Mountain, just off the Blue Ridge Parkway in North Carolina and uphill from the crossroads village of Linville. Every mid-July, some 30,000 Scots and pseudo-Scots flock here for one of the biggest Highland games and clan gatherings in North America. Not the oldest, for the Caledonian Club of San Francisco has been staging games since 1865, but probably the most spectacular of the 140-plus festivals of ethnic Scottishness held each year in the United States and Canada.

The site is named for the late Agnes MacRae Morton, who cofounded these games 27 years ago and until her recent death at 84 used to make her entrance at the Meadows riding regally in a golf cart. Her son Hugh, who owns the meadow and the mountain, is a grandson of Hugh MacRae, an MIT-educated engineer who bought 5,964-foot Grandfather and its high environs nearly a century ago.

This exuberant North Carolina version of the games puts you in mind of many things: a three-ring

At the start of a perfect six o'clock-to-12 o'clock heave, Ron Short is about to win the difficult caber toss.

Photographs by Kay Chernush

Marching behind drum major Charles Lineberry, massed bands lead off the annual Parade of Tartans.

Herbert MacNeal of Morristown, New Jersey, holds a 16th-century claymore, "great sword of the Scot."

circus, a track-and-field meet, a medieval jousting place ringed with pennanted pavilions, an immense family reunion, a state fair. It is as colorful as any of these, for all the men are in kilts (and the women in kilt-skirts) of at least 100 tartans, all harking back to the wearing of the Scottish Highland "belted plaid."

The long weekend opens on a ghostly note two nights before the games actually start. An announcer bawls out the names of clans ("Buchanan . . . Gunn . . . MacDougall . . . MacLeod . . .") and in the darkness a representative from each clan slowly marches toward the center of the Meadows, bearing a flaming brand. The pattern formed by their torchlights is a flattened X, reminiscent of the cross on which Scotland's patron saint, Saint Andrew, chose to be crucified. In all modesty he didn't want his cross to be upright like Christ's; his extremities were tied, not nailed, to the wood.

In the middle of the Meadows the clansmen fling their torches into blazing pits. (Fiery crosses were used for calling Highland Scots to battle in the 17th century.) Then an amplified bass voice intones Robert Burns' "Scots, wha' hae wi' Wallace bled," a chilling lyric if there ever was one, and the audience silently disperses to crowded campgrounds, hotels and the great houses of the rich, who are fairly numerous in these parts. At all such places they help along sleep with wee drafts of Scotch—nothing much, of course, for the next two nights are the times for the *ceilidhs* (pronounced "kaylees") or folk entertainments.

The clans compete—but not in killing

To this Welshman without a drop of Irish or Scottish blood, the events of the next few days are alternately rather ridiculous and quite moving. Many are warlike in origin, going back to the Dark Ages when rival clans butchered and beheaded each other's warriors, uniting only to fight the English; by now the clansfolk are all friendly, competing in tests of strength and elegance of dress but not in killing.

My, do they ever compete! Sprinters dash along the track that circles the Meadows. Broad jumpers fly through the air, pole vaulters soar up and over, marathon runners straggle in from the town of Boone, 18 miles away. Meanwhile the burly "heavies," thick-thighed shot-putters and hammer throwers, spin and grunt and let fly with their weights. Sheaf tossers see how high they can hurl hay-filled sacks—weighing 16 pounds dry, somewhat more after being rained on—with pitchforks. Wrestlers embrace, pausing now and then to hike up their kilts.

The most impressive feat of strength is the caber toss, or turn. One of the heavies balances a skinned tree trunk (100 to 120 pounds, 18 to 19 feet long) by the tapered end, staggering to keep it upright (p. 109).

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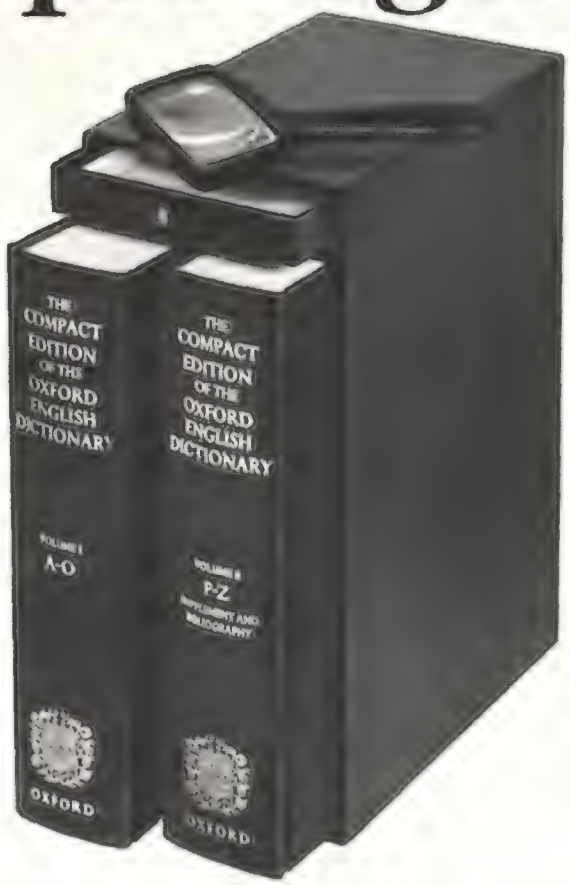

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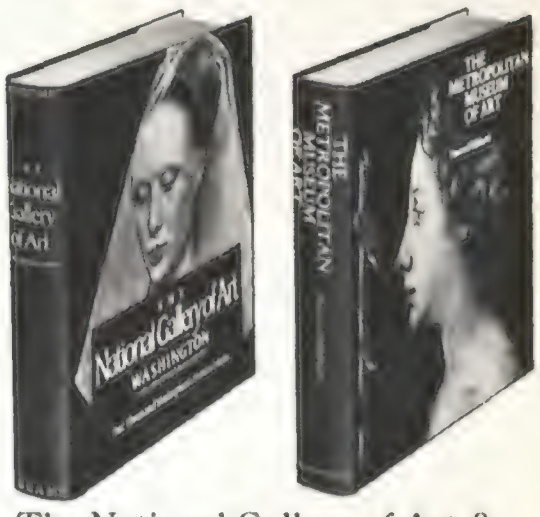

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Clad in MacGregor tartan, Arnold Pope of Fayetteville, North Carolina, is about to hurl 56-pound weight.

Looking every inch the hefty Scot enthusiast is chief piping steward Ben Frank, of Bowie, Maryland.

Then he tosses it forward so that it sails end over end, the object being to get the projectile to come to rest like a minute hand at 12 o'clock, pointing dead ahead of him. This may sound easy; it isn't. Nobody knows how or why the caber toss originated; the sport appears in 16th-century writings and one practitioner is said to have been Henry VIII.

Between two of his awesome tosses I ask another heavy, Fred Vaughn of Knoxville, Tennessee (six-feet-six, 285 pounds, 36 years old), what he does the rest of the year. "This," says Fred. "No pro football" (making a face to indicate that *that* would be sissy stuff). "Oh, I sell some real estate" (between appearances at Highland games). No sissy is Fred, named "Scottish Athlete of the Day" at MacRae Meadows.

As a diversion there are sheepdog trials, which are rooted in farming, not fighting. A trainer sends his little Border Collie (SMITHSONIAN, April 1982) out to herd a flock of sheep through a narrow opening. The dog races around like mad, then abruptly halts, head between paws, and lies still as a lion stalking a gazelle. The stupid, frightened sheep scamper obediently into an enclosure; the dog always wins.

One end of the Meadows is reserved for the Highland dancers. All day long the competitors, mostly young girls in kilt-skirts, have at it, accompanied by tootling pipers and watched by grave-faced judges.

Pipe bands compete loudly, jarringly, and so do solitary pipers, striding back and forth before judges who sit at little tables. There is an honor guest at these games who does not compete, except in charm. He is the Right Honourable Godfrey James MacDonald of MacDonald, Lord MacDonald, twenty-third chief of the Clan Donald (the first chief, named Somerled, was born around 1100). He comes from the Isle of Skye with his handsome English wife, Claire, with whom I have something in common: she, too, was not born to love the sound of bagpipes. After they were married and she confessed to her lack of enthusiasm, her husband "told her things had better change rather quickly."

Scotch salmon and (of course) haggis

At night there is a Tartan Ball, preceded by an invitational dinner at which 86-year-old Nestor J. MacDonald, chief of these games and deputy high commissioner of the American clan—at whose home Lord and Lady MacDonald are houseguests—is the host. One of the hors d'oeuvres is, naturally, cold Scotch salmon, flown in for the occasion. And another, of course, is tidbits of haggis, which tastes bitter at best, and worse when you think of what goes into it: chopped ox or sheep heart, liver and lungs minced with onions, oatmeal, suet and seasonings and boiled in the sheep's stomach.

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Doing the Highland Fling, Kim Demsey of Watertown, Connecticut, is already a dance champion at ten.

At one big party I ask a woman with a tartan sling supporting her broken right wrist: What do people get out of all this? " 'Clan' means 'family' in Gaelic," she tells me patiently, "and gatherings like this are family gatherings; we're all the 'children' of our chief. Once you get a kilt or plaid skirt on—anybody can, no matter what the surname—you're part of the family."

To an unkilted outsider, the most fascinating competition at this affair—one hardly mentioned by the competitors—involves male dress. At the Parade of Tartans around the Meadows' track, men and boys slowly stride along like massed peacocks, clan by clan. Some carry infants in arms or in a backpack. Many wear bonnets and impressively trimmed beards. Below their tweed jackets, *all* wear kilts of whatever flashy or subdued tartan goes with their clan. Kilts are expensive: the tartans cost $33 and more a yard, and to make a pleated kilt takes six to eight yards. Leather sporrans—pouches—or fur ones made with small animal heads, dangle from their waists; since the kilt has no pockets, the tasseled sporran serves as a purse. Time was when the answer to What does a Scot wear under his kilt? was Nothing. When the modern kilted male *has* to wear underpants—as for Scottish dancing—he often wears the brightest contrast possible; say, scarlet jockey shorts with his dark-patterned kilt, or Kelly-green ones with his red tartan.

Why this year is important

It would be possible to stop this account right here and say, "So much for the Highland games; when you've seen one gathering of the clans you've seen them all." Except for reasons we are about to go into, many people evidently do want to see them all, and besides, to Scotsmen this year of 1982 is important, being the bicentennial of the repeal of the notorious Dress Act.

The what? Every Scot knows about it, but most of the rest of us do not. To understand, you have to go back considerably more than two centuries. The early Highlander wore into battle nothing but a long linen shift, like a nightshirt; this left his legs free to run and his arms free to wield a claymore, or two-handed sword (p. 110), to greater effect. The shift usually was saffron-dyed, saffron being more available then than now. He also wore the belted plaid. The best way for him to put it on was to lie down on it, gather a belt around it, and stand up with the wraparound front of it coming down to his knees and the rest wound around his left arm, the better to cushion an adversary's blows.

The belted plaid gradually was replaced by the *philabeg* or "little kilt," which still left the Highlander's lower legs free. It did him little good, however, in the Jacobite "rising" of 1745. That was when

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Bonnie Prince Charlie (Prince Charles Edward Stuart), who thought his father and not George II should be sitting on the throne in London, rallied the Highland clans in an effort to make good his claim.

They met the English at the battle of Culloden Moor on April 16, 1746, where they fought ferociously but in vain. The beaten survivors were hunted down, and that was the beginning of suppression for the age-old clan system in which Highland families owed total allegiance to their chiefs. Shortly after, a punitive Parliament passed the Dress Act.

Under that piece of legislation nobody could wear a bonnet, a tartan, or any other article of Highland dress or weaponry unless he was a member of the British armed forces. The penalty for a first offense was six months in jail and for a second offense, transportation (for seven years) to a colony overseas, usually meaning Colonial America.

The hated Act was in force for 36 years, but in 1782 at last was repealed. By then, six years after the American Declaration of Independence, some descendants of men who had fought on either side at Culloden, when the British won, had fought on one side or the other in the American "rising," when the British lost. Once again it was legal for a Scot to flaunt a brightly colored tartan and to sport a foot-long dirk alongside his sporran. Today there are 98 Scottish clans with recognized chiefs, all fiercely loyal to their extended families and homeland; there are at least 350 tartan designs, or setts (not including several color variations for each), and, worldwide, hundreds of clan societies.

In the dimly remembered past when Scotsmen's strengths really had to be tested, and preparations for warfare well rehearsed, the games held all over Scotland included chariot races, mock battles and archery contests. In America there have been such substitute events as regattas, parachute jumps and, at Grandfather Mountain, hang gliders swooping down from the crags. And an annual scholarship that sends a North American student of Scottish descent to a Scottish university for postgraduate work.

In this vast melting pot of ours that has never completely melted, some nationality group is celebrating with heartfelt nostalgia virtually every day. The Italians of New York have their Feast of San Gennaro on Mulberry Street; the Irish in cities like Boston, and the Poles in Chicago, never let you forget where they came from. But nobody is as stubborn and fervent about it all as the Scots. Admiring stubbornness as I do, I'll probably enroll in one of their clans, paying the pipers and reserving the right to call the tunes—but not to listen.

A young spectator is framed by the bagpipe drones and by folds and pleats of the Red Scott tartan.

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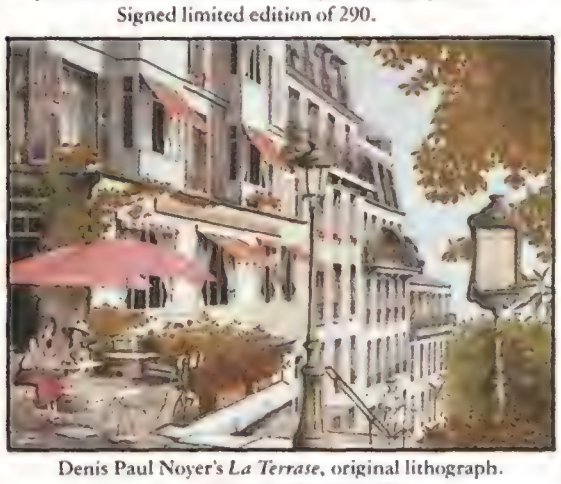

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By Joel Gurin

There's a lot more to birdsongs than the sound of music

It seems unlikely that songbirds have become so adroit merely for their own pleasure, or ours.

Avian singers, most of them males, may be versatile communicators, and scientists who study them are getting quite an earful

In a marsh in upstate New York, just before dawn, two figures crouch in the half-light. Several yards ahead of them, a bird alights. One of the group quietly lowers the barrel—of a directional microphone. These are not hunters, but biologists. Their quarry is not a duck or a goose, but a tiny, rust-colored swamp sparrow. They are after its song.

To most people, birdsongs are a tuneful diversion, the melodic accompaniment to a stroll through the woods. But to these scientists, birdsong is a major theoretical challenge. Their task is to discover what songs mean to birds themselves.

Birds' songs are so diverse, and so complex, that they can't just be an accident of evolution; they must mean *something*. The tune is often the most distinctive thing about the bird. Consider the brown thrasher. This rather dowdy-looking relative of the mockingbird can sing about 2,000 different melodies, certainly an achievement fit for a Guinness Book of Bird Records. Even common sparrows and wrens can learn a score or more different songs. It seems unlikely that they have become so versatile merely for their own pleasure, or for ours. Why, then—and how—do these small birds develop such a large variety of sounds?

At a refurbished country estate in Millbrook, New York, biologists from Rockefeller University are beginning to answer these questions. Here in Dutchess County, a thousand acres of woods (conveniently located near swamp and meadows where many songbirds live) have become the University's Field Research Center. A mile or so down a dirt road stands the gatehouse of the old estate, modeled on an English cottage; it now houses a score of researchers and dozens of finches, thrushes and sparrows. The place has grown by accretion. Beside the main house is a geodesic aviary made of wood and wire mesh and, next to that, a building marked "Parrot Aviary," converted to office space since the researchers turned from parrots to other birds.

Peter Marler, a pioneer investigator of birdsongs, looks in on one of his subjects, a swamp sparrow.

A guiding spirit here is Peter Marler, professor at the Rockefeller University and mentor to a generation of scientists now studying birdsong. Although he has worked in the United States for the last quarter-century, Marler still speaks with his native British accent in the soft, thoughtful manner of one who has made listening his life's work. Back in 1950, as part of his doctoral work in botany, he was surveying the qualities of mud in Esthwaite Water in England's Lake District. The listener in him came to the fore: Marler realized that the chaffinches he heard in different areas sang slightly different songs. Birds had been Marler's first love; he remembers telling his parents, at the age of eight, that he planned to become an ornithologist. He pursued the problem of song diversity, and soon birds, not plants, were the focus of his attention. His research led him to Cambridge, England, to Berkeley, California, and, finally, to Millbrook, which has become his permanent roost.

One way to understand avian communication, says Marler, is to begin with birdcalls, which are generally short and simpler than true songs. While only a few groups of birds sing, nearly all have some vocal system

Illustrations by John Huehnergarth

Unlike people, birds do not seem to freeze when in front of a microphone.

by which they communicate. Alarm calls, for example, are used to signal the approach of a predator. This is often a tricky business, since the bird sounding the warning could betray its position. But for several species, evolution has been a masterful acoustic engineer. Many small birds give a shrill whistling warning call that is like a ventriloquist's voice; it is hard for a predator, such as an owl or a fox, to locate in space.

Birdcalls may also have a subtler social meaning, however. Marler shares his office with two black-and-white cockerels, whose clucking, scratching and occasional crowing are an ongoing counterpoint to his explanations of their behavior. These birds call, says Marler, largely in response to other cocks. In fact, he has to place Styrofoam slabs between their cages to keep the birds from seeing each other; if they were in visual contact, their raucous conversation would dominate the room. The meaning of their surprisingly large repertoire of calls is still puzzling, and the topic will demand considerable research. "It's especially difficult to figure out what's going on in the animal's head when you're looking at signals that are produced in a social situation," says Marler.

Science writer Joel Gurin is an editor of American Health.

Generally, calls seem to be brusque and basic, attracting other birds to food, warning of enemies, or forming part of a social confrontation. In many species, such as chickens and ringdoves, calls are innate; the bird is born with the ability to make these sounds. True songs, in contrast, are usually learned through careful imitation of older birds. Because they are learned rather than inborn, songs can vary remarkably, even within a single species. Birds in different geographical areas sing in "dialects" that differ as much as human speech does between Maine and Mississippi. Each individual bird may have a unique repertoire composed of several different tunes. And some birds, like canaries, change their songs from season to season.

For all their grace and complexity, birdsongs—unlike calls—convey a message that is essentially narcissistic. Years of field studies have shown that a song is an ornate advertisement for the bird, a sort of musical calling card. First and foremost, a bird's song lets the listener know his species. (With a few exceptions, only males sing.) By singing, male birds can thus attract females of the same species during the mating season. A bird also uses his song to scare off intruders and protect his territory. Finally, variations in song may enable birds to recognize each other as individuals and to convey some idea of a singer's age, experience and his prowess as a potential mate. A typical birdsong message could mean something like this: "Male swamp sparrow here. I'm the one with the longish beak and short tail feathers, living in this clump of cattails. I'm fit, ready for mating and able to defend my turf!"

The meaning seems simple enough, dealing with the bird's preeminent concerns: sex and survival. But there is a paradox here. If that is all the bird is saying (or singing), why are such elaborate melodies necessary? Wouldn't simple calls, meaning "buzz off" or "come hither," be enough?

Donald Kroodsma, who recently left Millbrook for the University of Massachusetts at Amherst, believes that birdsongs represent meaningful variations on the themes of mating and defense. The very complexity of a song may indicate that a bird would be a good mate, or at least a lively one. Some polygynous wrens, which need to attract several females, become especially versatile songsters. The winter wren can sing some 30 different eight-second songs, each one intricately detailed. A long-billed marsh wren learns 100 songs or more, and can sometimes be observed, perched on a cattail, running through 50 songs or so without repeating itself. The bird, says Kroodsma, "is following the general rule: if you've got it, flaunt it."

In one experiment, Kroodsma showed a clear role for music in avian mating. He recorded a large number of canary songs, cut up the tapes and spliced them to make two groups of artificial songs: a set of simple, rather boring tunes, and one with much more melodic variety. The tapes were played to virgin female canaries who were reaching reproductive age. Females who heard the more elaborate songs built nests faster and laid more eggs than those that were played the less imaginative tunes.

Why do female birds prefer the better musicians? According to

The simplest bird calls may serve as essential messages—such as alarm.

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**In the August 8, 1969 issue of Time magazine, John Wayne said he would like to be remembered in these words, which in English mean, "He was ugly, was strong and had dignity."*

COLT – an American heritage

Born to sing, a young bird learns his songs by imitating adults.

Kroodsma, a bird's song may contain important clues to its reproductive fitness. Canaries elaborate their songs as they grow older. Thus, an especially tuneful bird may be one that has proved its ability to survive, and would be an attractive mate.

The song and the overall pattern of singing may also be important in establishing a bird's status with other males. Kroodsma discovered this in his first laboratory experiment with a pair of male, long-billed marsh wrens. Two females, taken from the same nest, did not thrive in the laboratory.

Although both male wrens lived, one never quite took to the laboratory environment; he was always a little sickly, and was dominated by his fitter companion. Using a tape recorder, Kroodsma taught each bird to sing the same sequence of nine wren songs. When they began to sing on their own, he noticed a curious thing: the sickly bird often echoed the healthy one, repeating the song he had just sung; but the fit bird rarely followed the scrawny one in this way. Apparently the healthy bird expressed his dominance by taking a leading role in singing. Kroodsma decided to give the invalid a little help, and amplified his singing with a microphone and loudspeaker. The tables turned: the robust wren, hearing this new, dominating voice, began to let the scrawny bird take the lead in their singing bouts.

Clearly, song learning is a complex affair. An innate ability to whistle, tweet and chirp is shaped by the pressures of competition for mates and status. Several biologists are now studying birdsong to unravel the ways that heredity and environment can interact in learning. Their work may also shed some light on the workings of the human brain and the development of speech.

A bird's innate ability to sing may never develop unless it hears the right models to imitate. Through a series of experiments begun two decades ago, Marler and his colleagues—including Mark Konishi, now at California Institute of Technology—have outlined the conditions that are generally necessary for birds to learn to sing. Deaf songbirds never produce anything more musical than a sort of tuneless buzz. The bird, like a young student learning the cello, must be able to hear himself. Some species, like doves, sing perfectly well when raised in isolation, but they are exceptional. In general, isolated birds produce a simple song, inferior to what a normal male sings. If the song of an adult bird is played on a tape, however, the young fledgling will imitate it well, even mimicking the adult's geographical "dialect."

Among the songbirds, it is the male who always gets the best part.

But some innate loyalty keeps most birds from learning to sing like other species. The song sparrow in your garden will refuse to learn the tunes of the swamp sparrow down by the river, and vice versa. White-crowned sparrows can learn some alien songs, but given a choice between their own and alien songs, white-crowns select the species song.

It seemed from these experiments that heredity somehow steered a young bird to recognize the right sounds. But was the bird's preference for its own species' song really innate? As Konishi recalls today, the researchers could not be 100 percent sure. "In all these studies," he says, "nestlings, five or six days old, were used. It was possible that these birds had somehow been influenced by listening to their parents singing during that short, early period."

Hoping to put his doubts to rest, Konishi undertook to raise sparrows from the egg. He went to the snows of the Sierra Nevada, where the birds nest in the spring, and brought the eggs back to an incubator in his laboratory. After hatching, each bird was kept in a separate, soundproof chamber where it would hear only the sounds the researchers played for it on a tape recorder. As an extra safeguard, a bilingual sign on the door commanded "No Silbe—Don't Whistle," to prevent any inadvertent human interference.

The results were crystal clear. The young birds were exposed to a whole auditory aviary; they heard tapes of a green-tailed towhee, Wilson's warbler, Oregon junco, chipping sparrow and robin, as well as an adult white-crowned sparrow. But the song they produced was a good white-crowned song, in a choice situation. "The fact is that a white-crowned sparrow does

Eugene Mihaesco

Specter and struggle.

Defeat and disaster seem unable to exorcise the specter of Communism because it's a system designed not to serve any society, but to protect its own power.

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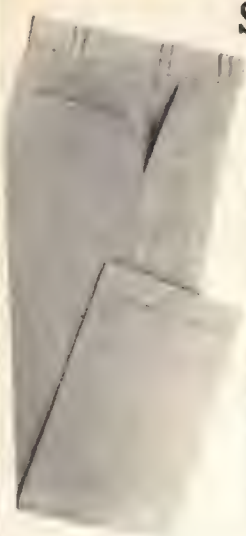

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Some songs are as intricate as operatic arias; females seem to prefer males who stand out as the better musicians.

not require any previous experience to recognize its own species' song," Konishi concluded. "It really has an innate predisposition."

The problem now is to identify the auditory clue that enables the bird to recognize white-crowned song without ever having heard it before. Konishi is studying this problem by raising birds on computer-synthesized imitations of white-crowned song. Since the parameters of computerized "songs" can be altered at will, it should be possible to learn precisely what aspect of the song holds the crucial clue.

Back at Millbrook, Peter Marler and Susan Peters have found one important lead. Their work suggests that the separate note groupings, or "syllables," of a song can be recognized innately by young birds learning to sing. They studied two kinds of birds native to the Millbrook area, the song sparrow and the swamp sparrow, whose similar names and appearance make it difficult for casual observers to tell them apart. The sparrows themselves, however, are apparently not confused. Marler and Peters used computer techniques to rearrange recorded swamp-sparrow syllables in a melody like that which a song sparrow might produce and, on a separate tape, did the opposite—putting song-sparrow syllables in a swamp-sparrow pattern. Young, isolated swamp sparrows imitated only their own species' sounds irrespective of the melody; moreover, they were able to rearrange them into true swamp-sparrow songs.

According to Marler, infants may have a remarkably similar ability to recognize the sounds that characterize human speech. Researchers at New Haven's Haskins Laboratories have used computer-synthesized sounds to examine the way people perceive the differences between syllables—between a whispered "pa," for example, and the voiced "ba." By varying the time between consonant and vowel, the computer produces an assortment of syllables that are "voiced" to many different degrees. Native speakers of very dissimilar languages, such as English and Thai, divide these syllables into "voiced" and "unvoiced" (whispered) in much

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the same way. Infants, too, respond to these sounds in a way that shows they group these syllables by the same criteria. "It's very clear," says Marler, "that the baby comes equipped with some innate perceptual equipment that helps it to parse the very variable structure of speech."

Birdsong parallels human language, too, in the process of development. Young birds begin with "subsong," a seemingly random testing of their "vocal cords." Charles Darwin compared subsong to an infant's babbling, and the analogy still seems apt today. Once the bird has learned how to produce the right sounds, it proceeds to organize them. In the stage called "plastic song" the bird experiments with different melodies, then finally settles on the patterns he will sing for the rest of his life.

Recently, Marler and Peters traced the development of song in 16 male swamp sparrows, recorded once a week for the first year of life. The project involved painstaking analysis of sonograms, electronically produced tracings of the frequency patterns that make up songs. Long scrolls of sonograms resemble arcane calligraphy written on a musical staff by an unseen hand. Even for a trained eye, deciphering a year's worth of these electronic scawlings is an arduous task.

For Marler and Peters, though, it has been worth the effort. Their work, the most detailed analysis of birdsong development to date, brought a major surprise: some birds may ultimately use only a fraction of their singing potential. The researchers found that sparrows produced four to five times as many syllable types during plastic song as they would use in their final melodies. Most of these syllables were sounds that they had never even heard, but had invented on their own. "Having thought of these sparrows simply as little learning machines," says Marler, "it was something of a shock to discover that." Why does the bird have this transient explosion of creativity? "You might think of some stages of subsong and plastic song as vocal play," muses Marler, "a search for inventiveness—novelty for its own sake."

From the expansive stage of plastic song, a swamp sparrow abruptly chooses only a few melodic patterns. No one knows what triggers the shift, but it is presumed to be under some kind of biological control. In general, hormonal factors, especially sex hormones, play a crucial role in guiding song development; they may be the reason that only male birds sing. Konishi and Mark Gurney dosed female zebra finches (who normally do not sing in response to male sex hormones) with male hormones shortly after birth, then injected them with more hormones later in life. With this

A bird's brain may learn singing much as a human's brain learns language.

Some nestlings readily learn to sing by listening to laboratory tapes.

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special treatment, the females, like males, began to sing.

Sex-hormone levels change with the seasons, and help trigger the start of singing in the spring. The hormones also have surprising effects on the brains of canaries, which learn a new group of songs every season. At Rockefeller University, Fernando Nottebohm has shown that the brain areas controlling song in these birds actually shrink and expand seasonally. This unusual plasticity, probably controlled by sex-hormone levels, raises the hope that the brains of other species—even humans—might be similarly adaptive given the right biological signal. "Take the example of a stroke that affects the speech area on the left side," says Nottebohm, director of the field station at Millbrook. "Many people have a hunch that the right side of the brain has the potential to redevelop a skill, that the 'brain space' is available. We still don't have the key to turn on this plasticity. But I think when people see this kind of plasticity in the brains of birds, they're going to be much more encouraged."

Already, several unusual facets of brain structure, first discovered in songbirds, have been found in other species as well. A decade ago, Nottebohm found, much to his surprise, that the two halves of the canary's brain differ in their function. Song control in virtually every bird studied was on the left side of the brain—curiously, the same side that houses the speech center in people. No one had found such differences between brain hemispheres in a nonhuman animal before. It now appears that the brains of some monkeys and rats, as well as several species of birds, show some hemispheric specialization.

A little later, Nottebohm and Arthur Arnold, now at UCLA, made another discovery: the areas that control singing in zebra finches and canaries are much larger in males than in females. The difference was so pronounced that it could be seen

without a microscope. The finding went against dogma that male and female brains should be virtually identical anatomically. But sex difference has been observed in other bird species—and there are similar findings even in humans.

Nottebohm's latest findings suggest that the size of the song area in the brain correlates with the number of songs a bird knows how to sing. According to Nottebohm, "This is the first time that a measure of 'intelligence,' in this case the ability to learn a motor skill, has been related to the amount of brain space devoted to that skill." The results are intriguing, but perhaps not totally surprising. The study of the songbird brain, says Nottebohm, "is a system that has given us nothing but 'firsts.' "

Bird brains, long synonymous with stupidity, have turned out to be sophisticated, finely tuned organs. Songbirds may well become the darlings of neuroscientists; they will certainly deepen our understanding of the brain. But these neurological studies are raising as many questions as they solve. A songbird's brain seems specially designed to enable the bird to learn and produce complex and elaborate songs. Why has evolution placed such a high premium on its singing?

Mark Konishi considers this, and shakes his head. "We have experimental tools to study the brain," he says. "But the *function* of song learning? That's the one area where we haven't been able to use any of our analytical tools." In comparison to the evolutionary question, he adds, "All these other things are easy."

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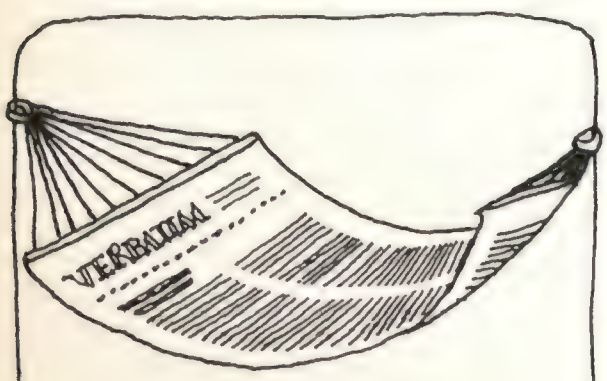

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When Lambert Strether comes home from Paris, in Henry James' *The Ambassadors*, one of the trophies he brings with him is a set of Victor Hugo. It is very conspicuously a matched set, bound in brilliant red and gold—"seventy blazing volumes," James calls them. Strether, and James behind him, was drawn to such sets.

Americans in general are drawn to such sets. As long ago as 1819, Ezekiel Sanford of Philadelphia began to publish a huge uniform edition of *The Works of the British Poets*. He had planned a hundred volumes, containing just about every poem ever written in England (this *was* 1819), but he ran low on money and the eventual outcome was 50: "the complete works of the more celebrated, and selected poems of the more obscure."

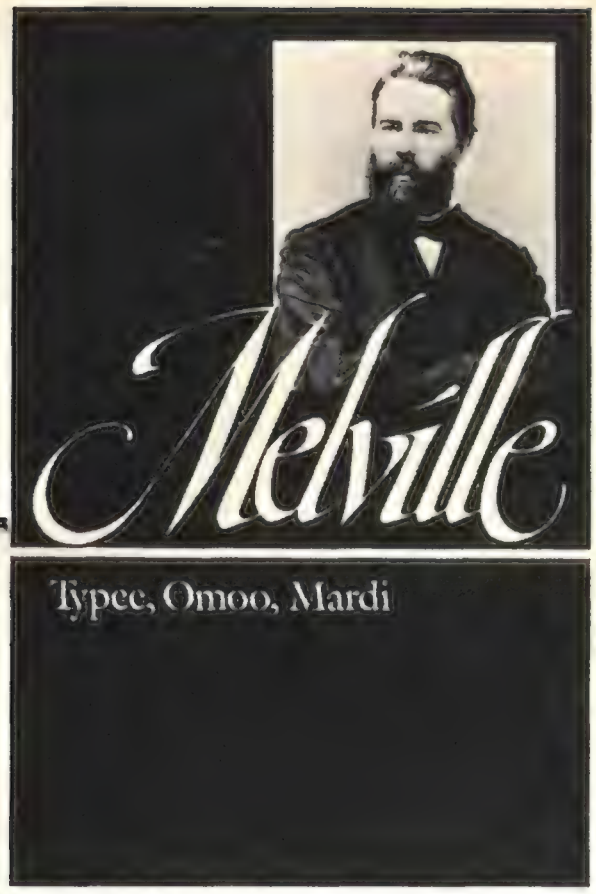
By the turn of the 19th century, collections of this sort were fairly tumbling off our presses. The Harvard Classics, alias Dr. Eliot's "five-foot shelf," was only the most successful of many. Nathaniel Hawthorne's son Julian edited an enormous set called The World's Great Classics. Justice Brewer of the Supreme Court did one called Crowned Masterpieces of Literature, and so on. The tradition continues to this day. There are limited-editions clubs, immortal-masterpiece societies, heritage groups. Some stress illustrations, some fine bindings. Some hold out the prospect of future gain (I think this is one definition of a "collectible"); others sincerely offer culture by the yard. A few are even concerned with a good text readably printed.

One thing that has not been collected on this grand scale is American literature itself. There are many reasons. Back in Sanford's day there *wasn't* much American literature worth collecting. By the time Lambert Strether came home with his Hugo in the 1890s, there was—but nearly all of it was still in copyright. More important, there wasn't really a market, and there wouldn't be for many years to come. Americans still had that humility that led them to look toward Europe for masterpieces.

In the rare cases where American literature *did* get collected, it was on the more-people - you - include - the - more - copies-you'll-sell principle. The funniest case is the 11-volume Library of American Literature edited by Edmund Clarence Stedman and Ellen Mackay Hutchinson and issued by Mark Twain's publishing company between 1884 and 1890. That work is chronological. Volumes six, seven and eight cover the period 1835-60, and about 370 American authors are crammed into those three volumes. Maybe 40 of them deserved inclusion. Henry Wadsworth Longfellow, yes; his brother Sam, no. Hawthorne, yes—but then he deserved more than one short story and a few snippets (five to ten pages) from his novels. These are not true collections.

It was not until after World War II that American literature acquired, in the eyes of most Americans, a stature equal to that of other great literatures, and hence became something truly worth assembling. Of course there had been sets of individual authors for many years—Cooper, Hawthorne, Emerson, James. There had even been sporadic movements toward getting at least New England writers together as a group.

But all of this was haphazard, and often careless. There was never any coordina-



Library of America volume of Herman Melville includes earlier works. Like *Moby Dick*, they drew upon his life at sea.

tion. A favorite work by some major American writer might be available in ten or a dozen editions, while other books by the same writer stayed out of print for a generation. These other books might be almost as good. They might even be better. For example, Howells' *The Rise of Silas Lapham* is always available in a surfeit of editions because long ago it got into high school curricula, where it turned many off Howells for life. (Not that it is a bad book; it is just bad for high school students.) Meanwhile, his glorious romantic comedy *Indian Summer*—a wonderfully apt novel in an age when so many men yearn to marry women half their age—has mostly been unavailable. It seems to have been in print only occasionally during the past 50 years—at least, whenever I wanted to use it in a course, I couldn't.

Soon after World War II, conditions began to improve. Our great universities, while not ceasing to edit Boswell, or Sir Thomas More, or Aristophanes, began to devote really careful attention to the American classics. Ohio State took on Hawthorne, Indiana took Howells, California and Iowa took Mark Twain, and so on. In each case, the intent was to establish a definitive text, and then to get—and keep—all of that author's work in print. Meanwhile, regular trade publishers

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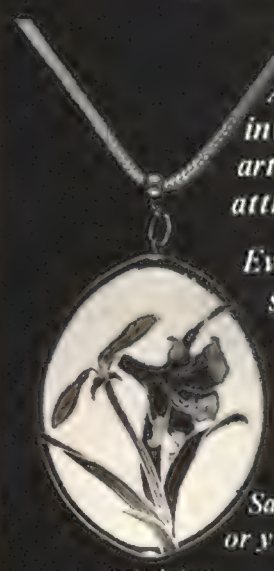

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found so good a market for a modern like Faulkner that every single one of his books came back into print; they are all available at this moment.

These were improvements, but they were hardly complete solutions. Neither trade publisher nor university press has got around to all our good writers. In 1982, if you want to buy Edith Wharton's *House of Mirth*, you can pick among five editions. But if you want *Twilight Sleep*, or *The Fruit of the Tree*, or *Hudson River Bracketed*, or *Xingu*, too bad. It is the same with Sarah Orne Jewett. Not counting one of those horribly overpriced library-reprint sets, she is represented in the market by four editions of *The Country of the Pointed Firs*. And by none at all of *A Marsh Island*, or *The Tory Lover*, or *The King of Folly Island*. Even Willa Cather is not quite fully in print.

Furthermore, most of the editions done by the university presses are not anything the general reader would want to buy. They are too heavy, too expensive, too elaborate. There has been coordination here, by the Center for Editions of American Authors of the Modern Language Association (MLA), and what that means is what you'd expect from a bureaucracy of scholars. The whole tedious process by which the text was established is included in each book. Not everyone wants page after page of comment on commas, or gives a damn whether Howells first spelled "millionaire" with one *n* or two.

Meanwhile, a solution was waiting impatiently in the wings. More specifically, it was waiting in the mind of Edmund Wilson. At least 30 years ago, he began to dream of a blazing row of volumes of American literature. They would be well edited, well printed, inexpensive and permanently available. His model was the great French enterprise called Pléiade, dedicated to putting all French literature of any importance into just such a series.

For a while in the early 1960s, Wilson thought an American Pléiade was going to happen. He had a number of influential supporters—most importantly, perhaps, President Kennedy and Jason Epstein of Random House. (Wilson was in his mid-60s, and it was the young and vigorous Epstein who was actually going to do the work of getting the grants and organizing the project.)

In the end it didn't, partly because support from the brand-new National

Author-critic Edmund Wilson: his dream was realized ten years after his death.

Endowment for the Humanities went to the university-press editions and not, as Wilson had anticipated, to "his" Pléiade. That in turn led to a famous and very slashing attack on university presses and on the Modern Language Association, which Wilson published in 1968.

It's a brilliant, snobbish, somewhat unfair article called "The Fruits of the MLA." Wilson left bullet holes in a good many American scholars, but he reserved his deadliest fire for the editors of the Ohio State Hawthorne, "the masterpiece of MLA bad bookmaking." He said their edition was crammed with boring textual matter (true) and historical trivia "of no interest whatever" (partly true). He said the paper it was printed on was heavy and grayish. He added that no normal person could even pick up a volume with any comfort. Referring coldly to Volume IV, *The Marble Faun*, Wilson said, "I have weighed it, and it weighs nine pounds." (I can't think what kind of scale he was using. I, too, have weighed it—or, rather, I got our postmistress to. On a U.S. postal scale, it weighed three pounds, three ounces.) Finally, with true Eastern arrogance, he regretted that so much of this scholarship was occurring in the Midwest.

After an attack like that, one might expect a certain resentment on the part of the discomfited scholars. But it has not happened. Instead there is a wholly unexpected happy ending to this story. Ten years after Edmund Wilson's death, the

American Pléiade is beginning to appear. The first four volumes of the Library of America have just been published; there will be four more in the fall, four more next spring, and so on indefinitely.

They are lovely books. If Lambert Strether were alive, he would certainly be buying them. Like the Pléiade itself, they are handsomely printed on India paper. They have texts as definitive and editorial matter as unobtrusive. In fact, more unobtrusive. Early on, the decision was taken to skip a lengthy— or, indeed, any—preface "on the ground that it wastes space and quickly dates. We expect these books to remain permanently in print." (I suspect a further, unmentioned reason for no prefaces is that in this distinguished series they aren't needed as sales come-ons. If there are ten competing editions of *Moby Dick*, an introduction by some famous scholar serves to set one off from the other nine. But the Library of America is already unique.)

Each volume does have, in the back, a chronology of the author, a brief discussion of the text and a sparing annotation. Not every reader will ever look at it. Those who do will find what they need.

But the wonderful thing is that most of the texts are precisely those so painstakingly achieved in the MLA editions that Edmund Wilson despised. Only here they are freed of their burden of apparatus. These are the definitive texts of our major writers, and the Library of America very sensibly arranged to use them.

More wonderful still, the same scholars that Wilson heaped such scorn on have turned around and helped to produce our Pléiade. One of the first four volumes, for example, contains all the stories and sketches Nathaniel Hawthorne ever wrote. It is edited, lightly and masterfully, by Professor Roy Harvey Pearce. Professor Pearce now teaches at the University of California, San Diego. But back when Edmund Wilson was spraying him with bursts of machine-gun fire, he had just left Ohio State—though he continued as a general editor of the ponderous MLA edition of Hawthorne.

There is something intensely and even joyfully American about that fact. It's a little like the career of a friend of mine who began as a novelist, turned professor at the University of North Carolina, moved to become the distinguished editor of the *Kenyon Review*, then became fic-

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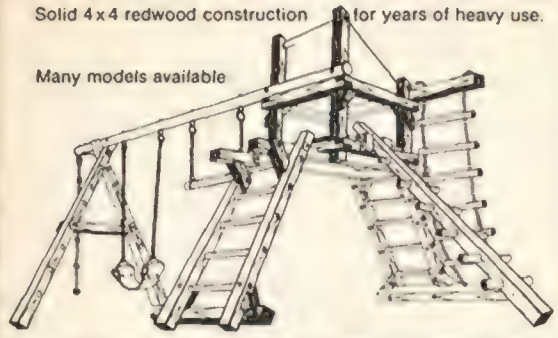
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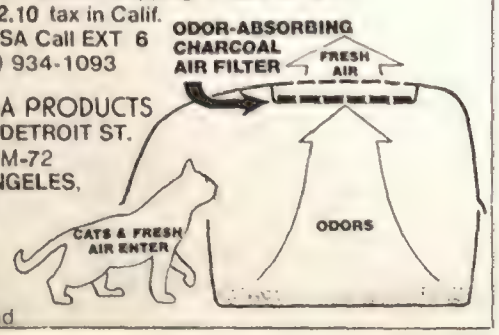

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Nathaniel Hawthorne wrote more than a hundred tales and sketches, was a master of allegory and multiple themes.

Harriet Beecher Stowe as she was toward the end of long, fruitful life. She wrote *Uncle Tom's Cabin* some 30 years before.

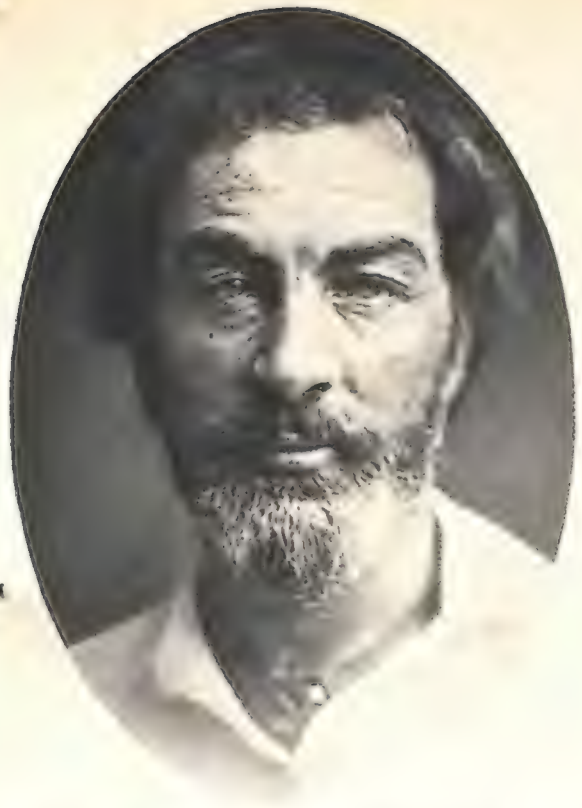
tion editor of *Playboy*. Wilson, a various man himself, probably would have liked it that one person could function in so many worlds. I think in the end he would also have enjoyed the fact that "his" Pléiade, compact and graceful, is partly the outgrowth of MLA scholarship. (It's also partly the result of handsome grants from the National Endowment for the Humanities and the Ford Foundation; of hard work by Jason Epstein, still at Random House, by Professor Daniel Aaron of Harvard and many others; and of bookstore distribution by Viking Press and mail order by Time-Life Books. All elements of our literary life are represented.)

All this isn't to say that the Library of America is henceforth what a lover of classic American literature will inevitably buy. There are still choices. Suppose that right now, in the summer of 1982, you decide that you want to put a really good edition of Hawthorne on your shelves.

One possibility would be to get the MLA edition, which is in print and thriving. It's true that its 14 volumes would cost you $246.50. It's also true that you would have a very handsome set of books. The paper is white, and the printing and layout are exceptionally beautiful. Nowhere else are you going to get wide margins and well-leaded lines like these.

Or you can buy the Library of America edition in four volumes; the tales and sketches now; a volume with Hawthorne's five completed novels in spring 1983; his unfinished novels, his biography of President Pierce, his other nonfiction in three or four years. If present prices hold, you'd be paying $100 in a bookstore, or around $90 by mail. (The actual offer for "charter subscribers" is $19.95 a volume—but shipping and handling charges will bring it up to more like $22.50.) You would be getting volumes slightly larger than the French Pléiades, but just as easy to handle, and considerably better made. Pléiades are on good paper, but they're bound in a plastic version of limp leather. The Library of America is printed on top quality, acid-free paper made to last 500 years. The volumes are bound in imported Dutch cloth, also made to last, and they are well sewn. On a U.S. postal scale, the first volume of Hawthorne weighs exactly two pounds. It has 1,493 pages.

Or, for a mere $10.95, you can buy what is called a Modern Library Giant: *The Complete Novels and Selected Tales of Nathaniel Hawthorne*. The title is a slight exaggeration. It's not quite all the novels, but it does contain the five that Hawthorne finished and that will make up Volume II of the Library of America version. Plus 37 of his 100-odd tales and sketches. Plus an introduction written (in 1937) by the late Norman Holmes Pearson of Yale. There are 1,223 pages, and our redoubtable postmistress calls it three pounds even.



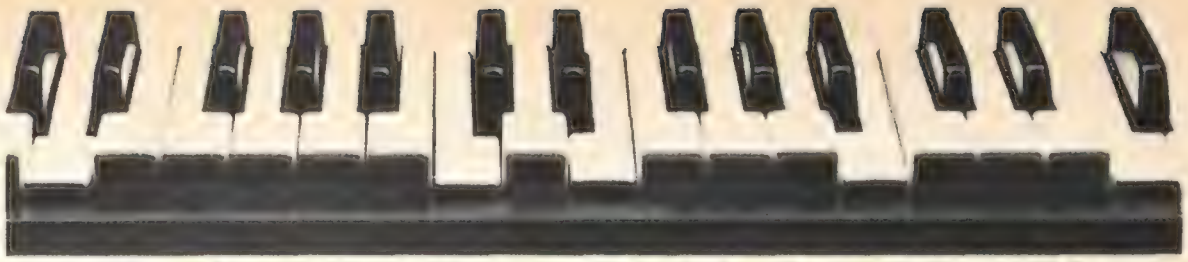
Walt Whitman, "at the beginning of a great career," as Emerson wrote, was just finishing first edition of *Leaves of Grass.*

As the date of the introduction suggests, Modern Library has had to make some sacrifices to achieve that moderate price for a large handsome book. One of them, of course, is modernity. This is the identical Hawthorne text that used to be a cloth-bound Giant for $4.95, and way back for $1.25. The type was set 45 years ago, and none of the (rather slight) textual improvements that have been made since 1937 are reflected here.

More serious is physical quality. The Modern Library Hawthorne has more looks than stamina. It no longer has a cloth cover, but one of vinyl-treated cardboard. The book is glued, not sewn, and it will eventually fall apart. The paper not being acid free, no harm in that. In short, this is a temporary book. No harm in that, either. Human beings are temporary creatures.

And yet, Hawthorne is not a temporary author. He is as close to immortal as any American has yet become. No closer, but as close. While our culture lasts, writers like Hawthorne, Melville, Whitman, Henry James and, yes, Harriet Beecher Stowe seem certain to be read. There *is* a case for 500-year paper when you are printing their books. I look forward to a hundred blazing volumes of the Library of America series, and I hope to own them all.

Noel Perrin
Professor of English, Dartmouth College



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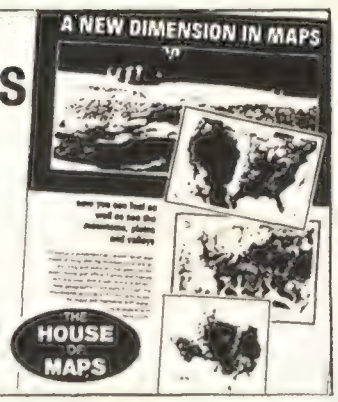

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Additional reading

Coast Guard (p. 32)

This is the Coast Guard by H. R. Kaplan and Lieut. Comdr. James F. Hunt, USCG, Cornell Maritime Press (Cambridge, Maryland), 1972

The United States Coast Guard 1790-1915: A Definitive History by Stephen H. Evans, U.S. Naval Institute (Annapolis), 1949

The United States Coast Guard: A Pictorial History by Gene Gurney, Crown, 1973

The U.S. Coast Guard in World War II by Malcolm F. Willoughby, U.S. Naval Institute (Annapolis), 1957

El Greco (p. 48)

El Greco and his School (Vols. 1 and 2) by Harold E. Wethey, Princeton University Press, 1962

El Greco of Toledo (exhibition catalog), National Gallery of Art, 1982

Figures of Thought: El Greco as Interpreter of History, Tradition and Ideas (*Studies in the History of Art*, Vol. 11) edited by Jonathan Brown, National Gallery of Art, 1982

Freshwater ponds (p. 62)

Watchers at the Pond by Franklin Russell, Knopf, 1961

Fresh-water Invertebrates of the United States by Robert W. Pennak, John Wiley and Sons, 1978

Grzimek's Animal Life Encyclopedia (Vol. 2), edited by Bernhard Grzimek, Van Nostrand Reinhold Company, 1975

City of David (p. 72)

Digging for God & Country by Neil Asher Silberman, Knopf, 1982

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Biblical Archaeology by G. Ernest Wright, Westminster Press (Philadelphia), 1957
Jerusalem: Excavating 3000 Years of History by Kathleen M. Kenyon, McGraw-Hill, 1967
Digging Up Jerusalem by Kathleen M. Kenyon, Praeger, 1974
The Mountain of the Lord by Benjamin Mazar, Doubleday, 1975

TRON (p. 86)
Of Mice and Magic: A History of American Animated Cartoons by Leonard Maltin, McGraw-Hill, 1980
Principles of Interactive Computer Graphics by William Newman and Robert Sproull, McGraw-Hill, 1979
"Smoothers of the Lost Arc" by Theodore Nelson, *Creative Computing*, March 1982

Golden Gate Bridge (p. 98)
Spanning the Gate: The Golden Gate Bridge, a photo documentary with text by Stephen Cassady, Squarebooks (Mill Valley, California), 1979
High Steel by Richard Dillon, Celestial Arts (Millbrae, California), 1980
"The Bridge" by Jon Carroll and Tracy J. Johnston, *California*, November 1981
Golden Gate: Biography of a Bridge by Allen Brown, Doubleday, 1965
Joseph Strauss, Builder of the Golden Gate Bridge by Michael Chester, Putnam's, 1965

Scottish games (p. 109)
Scotland Forever Home: An Introduction to the Homeland for American and Other Scots by Geddes MacGregor, Dodd, Mead, 1980
So You're Going to Wear the Kilt by J. C. Thompson, Heraldic Art (Arlington, Virginia), 1982
Scottish Highland Games by David Webster, Reprographia (Edinburgh), 1973
The Highland Clans by Sir Iain Moncreiffe of that Ilk, Clarkson N. Potter, 1967

Birdsong (p. 118)
Bird Vocalizations, edited by R. A. Hinde, Cambridge University Press, 1969
Vocal Communication in Birds by Clive K. Catchpole ("The Institute of Biology's Studies in Biology," No. 115, London), University Park Press (Baltimore), 1979
How Birds Learn to Sing by Barbara Ford, Julian Messner, 1975

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Documenting the artists and writers of Paris and, later, the sweeping spectacle of New York is a splendid photographic exhibit at the National Museum of American Art. "Berenice Abbott: The '20s and the '30s" includes 100 vintage prints which capture the essential character of her subjects, whether it is the listless hand of James Joyce or the canyonlike spaces created by Manhattan skyscrapers.

A Midwesterner by birth, Berenice Abbott left Ohio State University in 1918 to seek a journalism career in Greenwich Village. She went on to Paris where, five years later, avant-garde photographer Man Ray needed an assistant—someone, he insisted, who had no experience with the medium. He hired Miss Abbott. Through many hours in the darkroom she developed not only his pictures but also her own photographic eye. At his urging, she picked up the camera herself, and by 1925 had her own portrait studio on the Left Bank. Today, still active, she lives in rural Maine. The show closes August 29.

Special July exhibits and events

Cooper-Hewitt Museum (New York)
Button, Button (through August 22) Some 500 ornamental buttons of wood, bone, glass and other materials.
The Column: Structure and Ornament (through August 22) Styles and uses.
Basketry Tradition in New Form (ends August 22) Variations by nine artists.
The Jacquard Loom: Recent Experiments (May 18-August 22) Fabrics produced by contemporary fiber artists on this traditional loom.

National Portrait Gallery
Selections from the Photography Collection (July 9-August 22) Portraitists.
Frederick Hill Meserve Collection Inaugural exhibition of the Meserve Gallery focuses on personalities of the Civil War era from the recently acquired collection of Mathew Brady's glass plate negatives.
Daniel Webster: The Godlike Black Dan (through November 28) Memorabilia.

National Air and Space Museum
Twenty-five Years of Space Exploration (opens July 2) Major exhibit; self-guided tour information available.
Space Shuttle Close-up (July 5-7, noon) Three minilectures on the shuttle.
Photographing the Constellations (July 3, 9 A.M.) Monthly sky lecture.

Renwick Gallery
The Grand Renwick Souvenir Show (through October 11) Objects by American craftsmen relating to the museum.
Posters for a Picnic (through September 19) A dozen posters announcing the annual company picnic of Herman Miller, Inc., Zeeland, Michigan.

National Museum of American Art
Berenice Abbott: The '20s and the '30s (through August 29) Photographs from her Paris and New York years (below).
Elihu Vedder's Drawings for "The Rubáiyát of Omar Khayyám" (through October 15) Some 50 illustrations.

National Museum of Natural History
Inua: Spirit World of the Bering Sea (through January 2) Eskimo society as it was; lecture, July 9, noon.
Films (Fridays, noon) Nature films, including *Nanook of the North*, July 23.

Radio Smithsonian

Pinocchio's 200th birthday, cartoonists, American composers, and recipes to fight summertime bugs are among the July listings for Radio Smithsonian. To find which local stations carry these programs, write Smithsonian Office of Communications, A&I 2472, Washington, D.C. 20560.

Berenice Abbott's *Janet Flanner*, circa 1927, is at Museum of American Art.

Smithsonian events

For price information and tickets to Resident Associate events, call 357-3030:
Space Fiction in Film (Tuesdays, beginning July 27; 7:30 P.M.) Six-week series.
Wanderings in the Sinai (July 22, 8 P.M.) Ecology lecture by Dr. Farouk El-Baz.
Island in the Sun (July 12, 8 P.M.) Geologist Ian C. Macintyre reviews research on the Belizean Barrier Reef.
The Many Faces of Mime (July 14, 8 P.M.) Demonstration by Mark Thompson.
The Figure of the Fashion Designer (July 7, 8 P.M.) Lecture by Anne Hollander.
Tracing Your Family History (July 1, 7:30 P.M.) Advice from Milton Rubincam.

Smithsonian Institution Traveling Exhibition Service

SITES circulates exhibitions to hundreds of cities. To sponsor a show in your community, write to SITES, Smithsonian Institution, Washington, D.C. 20560. Here are some July exhibits:
Huntsville, Alabama (July 10- August 22) *The Contemporary American Potter*, Huntsville Museum of Art.
Sacramento (July 17-September 12) *Renaissance of Islam: Art of the Mamluks*, Crocker Art Museum.
Savannah (July 24-August 29) *Paintings of the Figure from the National Academy of Design*, Telfair Academy.
Apple Valley, Minnesota (July 24-August 22) *Fish Rubbings and Nature Prints*, Minnesota Zoological Garden.
Billings, Montana (July 24-August 22) *Impressions of the Steam Engine in America*, Western Heritage Center.
Jamestown, New York (July 3-August 1) *American Drawings III*, James Prendergast Library Art Gallery.
Austin (July 3-August 15) *The 18th Century of George Washington*, Lyndon Baines Johnson Library and Museum.

Membership benefits

A previsit packet for Associates planning a Washington visit is free; send postcard request or phone, Associates Reception Center, Smithsonian Institution, Washington, D.C. 20560 (202-357-2700, or, for hearing impaired, TDD 202-357-1729). Allow two weeks for receipt.

Through Labor Day, the National Air and Space Museum is open 10 A.M.- 9 P.M. daily; most other Smithsonian museums are open 10 A.M.-5:30 P.M. The special welcome for visiting members at the Associates Reception Center in the castle, 10 A.M. to 4 P.M. daily, includes a briefing on benefits—a slide-lecture orientation to the 13 Smithsonian museums; dining at the members' restaurant, The Court; relaxing in the Associates Lounge; and discount privileges.

Highlights continued

A renovated animal house

A 400-pound tortoise, a 15-foot python and 400 additional snakes, lizards, turtles, crocodiles, salamanders and frogs provide drama enough at the National Zoo's Reptile and Amphibian House. But what zoo biologists boast about are such events as the hatching last winter of 16 Oriental fire-bellied toads.

However, recent renovation of the reptile house has brought more than just another bunch of pretty faces. "We've always had an advantage in breeding animals because the house is so big," says curator Dale Marcellini. "But now the exhibit space is better organized, the mechanical systems—plumbing, heating—they're improved, we have large holding and research areas, and the cages have plenty of plants and rocks so we hope the animals will breed on exhibit."

The reptile house is the zoo's second most popular exhibit. (Pandas are first.) The 1931 brick building is almost as ornate as some of the species within, with its lofty eight-sided tower, gargoyles, colorful mosaics and columns atop stone turtles. The two-year renovation includes three modern houses for crocodilians, these days basking contentedly in the sun. Also new is Herplab, a unique biology learning center opening in the fall. Visitors will be able to work with various animals and materials in the lab and look through glass walls to see keepers handle the real stuff. A prototype for other zoos, Herplab was financed largely by a National Science Foundation grant and developed by education officer Judith White. On hand will be live specimens, animal skins, films and specially designed games, one of which teaches lizard behavior and—you guessed it—each player gets to be a lizard!

Carol Simons

Behind glass, anacondas are among 90 species in Reptile and Amphibian House.

Gaboon viper, native to Africa, is richly marked—and poisonous.

Like many lizards, a water dragon is difficult to breed in captivity.

Common iguana is sometimes eaten by Man, thrives on salad at zoo.

Naturally, a green tree python fits in well with its forest environment.

Cuban crocodiles are to stay in the main building; others go to new houses.

Photographs by Jessie Cohen

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Travel and Study, at Home, Abroad . . . and

As a Smithsonian Associate, you can enjoy the benefit of culturally oriented experiences under the guidance of museum curators or visiting scholars. Your lively curiosity and broad interests have resulted in a comprehensive study program to meet many tastes and budgets.

Domestic Study Tours

High Sierra Base Camp July 17-24: Amid awesome scenery, study geology, ecology and brilliant constellations with daily hikes and lectures in California's backcountry.

Desolation and Gray Canyons July 21-31: White-water trip for the adventurous; explore geology, wildlife and exciting Indian and outlaw history on Utah's Green River.

Colorado Rockies August 1-7: Study astronomy, geology, botany and zoology at an environmental center near Pike's Peak.

Salmon River August 5-12: See bears, bighorn sheep and spectacular scenery while rafting in Idaho's wilderness.

Isle Royale August 20-29: Hike through the remote and pristine wilderness of this Lake Superior island.

Colorado Mining and Railroad History August 21-29: Trace the colorful Gold Rush Era from Denver to Durango.

Massachusetts Heritage August 21-30: Architecture, antiques, music and beautiful countryside from Boston to the Berkshires.

Canyon and Mesa Archaeology September 10-21: Enjoy autumn at Mesa Verde, Chaco Canyon and the Hopi reservation.

Pacific Northwest September 17-26: Visit Mt. Rainier, Olympic Peninsula, San Juan Islands and British Columbia.

Washington, D.C.: Power and Style September 21-26: See varied aspects of the capital, from the halls of Congress to private homes.

The Tetons October 4-12: Glowing with autumn colors, the magnificent peaks in this national park provide a backdrop for natural-history study.

Philadelphia October 6-10: Celebrate the city's 300th anniversary with this special in-depth tour.

North Carolina October 6-14: Enjoy local hospitality in the historic homes of Old Salem, New Bern and Edenton.

Great Smoky Mountains October 7-14: Camp, hike and learn about the pioneer history of North Carolina.

Chesapeake Birds October 8-14: From Chincoteague, Virginia, to Cape May, New Jersey, observe vast flocks of migratory birds.

Sapelo Island November 7-13: Camp on unspoiled beaches while studying the ecology and history of this Georgia barrier island.

Everglades November 27-December 4: Explore remote areas of this subtropical wilderness, teeming with birdlife.

Washington "Anytime" Weekend An economical and convenient way to visit your choice of Smithsonian museums for two or more nights at Loew's L'Enfant Plaza or Hyatt Regency. Package includes hotel, two meals, Tourmobile ticket, and exclusive tour of Smithsonian castle. Applications and payment must be received at least ten days prior to arrival.

Foreign Study Tours

These tours range in size from small group experiences to charter adventures and vary in price from low cost to deluxe, depending on the type of travel, destination visited and length of trip:

People's Republic of China 1982 New exclusive programs for travel with a Sinologist to learn about the art, ancient treasures, temples and bustling cities of this complex culture.

Adriatic Shores August 28-September 9: From Athens, a delightful cruise aboard the *Argonaut* provides an unusual maritime perspective of centuries of creative genius in Italy and Yugoslavia. Renowned palaces, cathedrals, mosaics and masterpieces are as glorious as nature's striking contrasts in coastline and scenery.

Historic Cities and Romantic Roads of Germany August 29-September 12: Munich followed by a choice of travel: south into the Alps, north to the Danube, or visit the Black Forest and the Rhineland.

Oxford/Smithsonian Seminar September 10-25: Iron Age Archaeology and British Literature are among in-depth courses taught by Oxford faculty. Stay in Worcester College with visits to Cambridge, Bath and Stratford for a performance.

Sailing the Greek Islands September 21-October 3: Set sail on the luxurious 317-foot, four-masted yacht *Sea Cloud* for an idyllic journey from Athens to Santorini, Crete and the coast of Asia Minor.

Amazon Passage September 30-October 16: Fascinating scenes of dense jungle, colorful birds, villages and river life on this voyage aboard the M.S. *World Discoverer*, traveling 2,000 miles from Belém to Iquitos.

England's Narrow Canals October 2-13: Cruise through renowned countryside on several famous canals, assist with the operation of the locks, and meet with local preservation groups.

Italian Contrasts October 2-17: An extended stay in Florence, with visits to Tuscany and Umbria; or, explore Venice and the Lake District.

Performing Arts of China and Japan October 16-November 7: The exotic sounds and color of Oriental drama; performances, theater schools and backstage visits.

Seminar in Salzburg October 23-November 7: Stay in an opulent palace; study Baroque Era or opera history. Museums, theater and concerts.

Kyoto Seminar November 5-21: Live Japanese style; visit shrines and gardens of Kyoto and Nara; study Japanese history.

The Ancient World of Peru November 5-21: Visit Lima, Cuzco, Indian markets and amazing Machu Picchu.

New Zealand November 17-December 3: In-depth tour with talks on natural history, the Maori heritage, parliament and a home visit.

A Hike in New Zealand November 17-December 3: Take the "finest walk in the world" along the Milford Track, from Lake Te Anau to Milford Sound.

The Atlantic Crossing November 26-December 11: A sailing adventure from the Canary Islands to Martinique on the square-rigged, four-masted bark *Sea Cloud*.

Write National Associates, A&I 1278 Smithsonian Institution, Washington, D.C. 20560 or call (202) 357-2477 for specific tour brochures

in Washington

Selected Studies Seminars

Enjoy the treasures of the Smithsonian in popular programs and special behind-the-scenes tours. Choose from:

Lost World of the Maya September 26-October 1: George Stuart, renowned archaeologist at the National Geographic Society and author of *The Mysterious Maya*, sheds the latest light on one of the great epics of history—the rise and fall of the brilliant Maya civilization—in illustrated lectures, decipherment workshops and tours of a famous collection.

Aircraft Restoration: How To October 3-7: The master craftsmen of the National Air and Space Museum share their many techniques in workshops at the Paul E. Garber Facility (formerly Silver Hill).

American Antique Furniture October 3-8: Connoisseurship of masterpieces, 1650-1840. Includes great collections, detection of fakes, care of antiques and tours of the Winterthur Museum and the elegant Diplomatic Rooms at the Department of State.

Tibet: Lost Horizons October 17-22: The culture, history and art of this rich civilization, along with behind-the-scenes tours of the Freer Gallery and the best private Tibetan art collection in the United States.

China: A Cultural History October 24-29: From prehistory to the enigmas of today, with emphasis on intellectual and artistic traditions and the great philosophies and religions. Includes recent films and tours of the outstanding collection of the Freer Gallery of Art.

Princes and Patriots: Flemish and Dutch Painting in the 17th Century November 14-19: Lectures and tours of the masterpieces of Rembrandt, Hals, Vermeer, Rubens, Van Dyck and other artists in the National Gallery of Art with art historian Bill Kloss.

Connoisseurship of Gems November 7-11: Nationally known gem expert and author, Benjamin Zucker, gives a comprehensive look at the sumptuous world of precious gems in lavishly illustrated lectures. Participants also become familiar with the famous gems and jewelry in the magnificent collection at the Smithsonian.

or (202) 357-2475 for seminar brochures.

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By Richard Conniff

Poor Weinberger—his name is too long for headline writers

In idle moments, William Attwood, graduate of Choate and Princeton, former diplomat, editor, publisher and author, likes to turn over in his mind two or three examples of what may be the most influential American literary form. He treasures the words like poetry: QUIZ 8 IN AX FEST and TOT, 2, SLAYS DAD.

Attwood is an aficionado of the headline, a form that surfaced in America during the War of 1812 and that has since flourished within mechanical limitations that have been likened to the Japanese *hokku*, or to writing on the head of a pin. It is the headline writer's job to sum up pages of copy in a few brief lines—quickly, pithily, even sometimes wittily, and always with a scrupulous regard for double entendre and the laws of libel.

The results are often intentionally amusing. Is there a cheese shortage in Italy? The *Los Angeles Times* dryly comments: PARMESAN: CRISIS GRATES ON ALL ITALIANS. Do consumers protest rising meat prices? The New York *Daily News* headlines it this way: PRICES SOAR, BUYERS SORE, COW JUMPS OVER THE MOON.

But flubs are also common, and they are even more of a delight to headline watchers. Thus the *Detroit Free Press* once soberly informed readers that MILK DRINKERS TURN TO POWDER. Recently its rival, *The Detroit News*, announced: COLUMBIA DOES ENCORE, A PERFECT LAUNCH FOR 'USED' SHUTTLE. Alas, when 300 copies of this first edition hit the streets the space shuttle was still stuck on the ground.

And at the *Spokane Chronicle*, some copy-reader once summed up an editorial with the succinct lament: LOT OF WOMEN DISTRESSING.

All reporters have their favorite headline stories (which, it must be said, reflect reality about as accurately as the headlines themselves). One such story has it that during the Newark, New Jersey, riots of 1967, a night editor put out his paper literally from under the city desk, because the newsroom was being fired on by snipers. The wishful headline on his lead story the next day: VIOLENCE DECREASES: PRESS HUNT FOR SNIPERS. My own favorite headline also ran in a New Jersey newspaper, but it is so flat, so unnewsworthy as to have a kind of Oriental timelessness: NUMBER SIX BUS STILL GOES TO IRVINGTON.

The headline writer's work is anonymous (perhaps fortunately) and ill-rewarded, yet it can have enormous sway. Headlines have changed geographic names (Cleaveland became Cleveland apparently the better to fit a one-column head), sports (the Yankees were originally the Highlanders, until, the story goes, one New York sports editor protested), and even the way we speak: headline writers have given us such chopped-down words as A-bomb, nuke, champ, flu, quotes, quake, prof and polio, and they have institutionalized a brassy, all-American vocabulary tending toward monosyllables such as blast, smash, hurl, plunge, ram, crash, spike and nab. They have even kept alive the rather ugly acronym GOP long after the words "Grand Old Party" began to seem quaint.

Arguably, the limitations of the headline have also helped shape political fortunes. Thus Secretary of the Interior James G. Watt explains his notoriety this way: "Headline writers love my name—short count, fits one-column head very neatly." (Indeed, Watt himself here talks like a headline, dropping pronouns and other excess linguistic baggage.) Is it likewise any wonder that Secretary of State Alexander Haig fares better in headlines than the Defense Department's Caspar Weinberger? Or that our late President Dwight D. Eisenhower, blessed with the nickname "Ike," outdid Presidential candidate Adlai Stevenson? By contrast, there is Senator Howard Metzenbaum, who has appeared in print as METZ (not to be confused with Mets, the abbreviated name of baseball's New York Metropolitans, which in turn spawned such headline-worthy team names as Jets and Nets). An American writer commented in 1924 on the newspaper headline: "Only an exuberant people . . . on the one hand shrewd, practical, strong and in some respects coarse, but on the other hand intensely idealistic . . . could invent a thing at once generally so hideous and occasionally so intensely dramatic as almost to achieve the dignity of art."

Today when we are more at home with our national character, the headline deserves to be celebrated. It is part of us. Even in the middle of the television era, its patterns remain indelibly imprinted on our thinking. Indeed, some say the headline will be with us unto Armageddon itself. According to one wag, the tabloids doubtless will report it like this: BIG BANG TOMORROW, SERIES OFF: NO WORLD.

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